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APRIL, 1954

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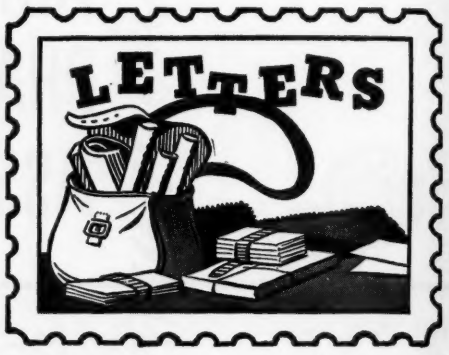

Concurs

Sirs:

I concur wholeheartedly, on all three counts, with Malvin S. Aaronson of Philadelphia, Pa., whose letter appeared in the February issue.

Pharmacists in the service are indeed underrated for the amount of professional acumen they bring to their jobs and the assistance they give to the mission of the medical field. Read in a recent issue the complete information upon opportunities for pharmacists contemplating military service and desiring reserve commissions as medical supply officers. This is a large step forward. Two years ago this printing would have thwarted a lot of recruiting sergeants whose stand was recruit them and let someone else tell them of the chances they missed to come in with a commission or at least two stripes on their arm.

Recently I have heard the complaint that a pharmacist is becoming a bottler rather than an artist in his profession. Needless to say this is a faulty concept. As a physician's right hand man and a public health servant we need know much more in the field of synthetic chemistry, specific drug action, and the field of available commercial preparations than heretofore. Few professions require so high an ethic sense and so diligent an application of our ability to learn and remember, still retaining the artistry attached to our profession. The pharmacist now as always fills the prescription exactly as the doctor has written and prescribed.

Sincerely,

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EDITOR'S NOTE: Other members' opinions are invited.

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1. Kline, P. R., and Caldwell, A.: New York St. J. M. May 1, 1952.
2. Combes, F. C., and Zuckerman, R.: J. Invest. Dermat. 16:379, 1951.
3. Kline, P. R.: Current News in Derm. & Syph., May 1952.

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Members of the American Pharmaceutical Association are invited to submit their professional problems to The Journal, 2215 Constitution Ave., N. W., Washington 7, D. C., giving all pertinent details in your first letter.

Sunscreen Ointment

I would appreciate any information you might give me on compounding the following prescription. It yields too thin a cream.

Sodium p-aminobenzoate	5
Cetyl alcohol	15
Cera alba	1
Propylene glycol	10
Sodium lauryl sulfate	2
Water	72

Sig.: Make as ointment to prevent sunburn.

—C. N. M., California

The ointment base ingredients in this prescription are those of E. C. Beeler's ointment base No. 8 [*Bull. Nat. Formulary Comm.*, 11, 27 (1943); also see *Remington's Practice of Pharmacy*, 10th Ed., p. 300]. It is prepared as follows: Melt the cetyl alcohol and white wax in the propylene glycol on a water bath and heat to about 65° C. Dissolve the sodium lauryl sulfate in the water and heat to about 65° C. Slowly add the oil phase to the well-stirred water phase and continue stirring on the water bath for about ten minutes. Remove from the bath and continue stirring until it congeals.

The sodium *p*-aminobenzoate can be incorporated in the cooled base. The five parts of sodium *p*-aminobenzoate might be replaced with three parts of ethyl *p*-aminobenzoate incorporated in the same manner.

Hydrophilic ointment U. S. P. is a modification of Beeler's ointment base. This might yield a more desirable product.

Danish Prescriptions

How should the following Danish prescriptions be interpreted?

No. 1.	*Pyrolei betulae*	2
	Pasta zinci mollis	98
No. 2.	*Acidi tartarici*	1
	Ungventi glycodermi	99

—R. W. M., Kentucky

In the first prescription the nearest equivalent to pyrolei betulae is rectified birch tar oil. This item has not been available in the United States for some years, but you might have some in stock dating back several years. The next best equivalent is juniper tar which is about three times as active as birch tar oil. In other words, you should use only 1/3 as much of the juniper tar as the prescription calls for. Pasta zinci mollis D. P. is composed of 30% zinc oxide and 70% petrolatum.

The second prescription is for 1 Gm. of tartaric acid incorporated in Ungventi glycodermi. The formula for Ungventum glycodermi D. P. is:

Glycerin	780.0
Starch	110.0
Methyl para-hydroxybenzoate	1.0
Ungventum dermotheli simplex	50.0
Lemon oil	2.0
Lavender oil	0.5
Distilled water, *q.s.*	1000.0

The formula for Ungventum dermotheli simplex D. P. is:

White wax	80
Wool fat (anhydrous)	360
Peanut oil	360
Distilled water	200

There appears to be no proprietary counterparts of these prescriptions available and they should be compounded in the usual manner for grease ointments.

Darrow's Solution

What is Darrow's Solution?—A. R., Washington, D. C.

Darrow's Solution contains:

Potassium chloride	2
Sodium chloride	3
Sodium lactate, 1 *M* solution	40
Sterile distilled water	710

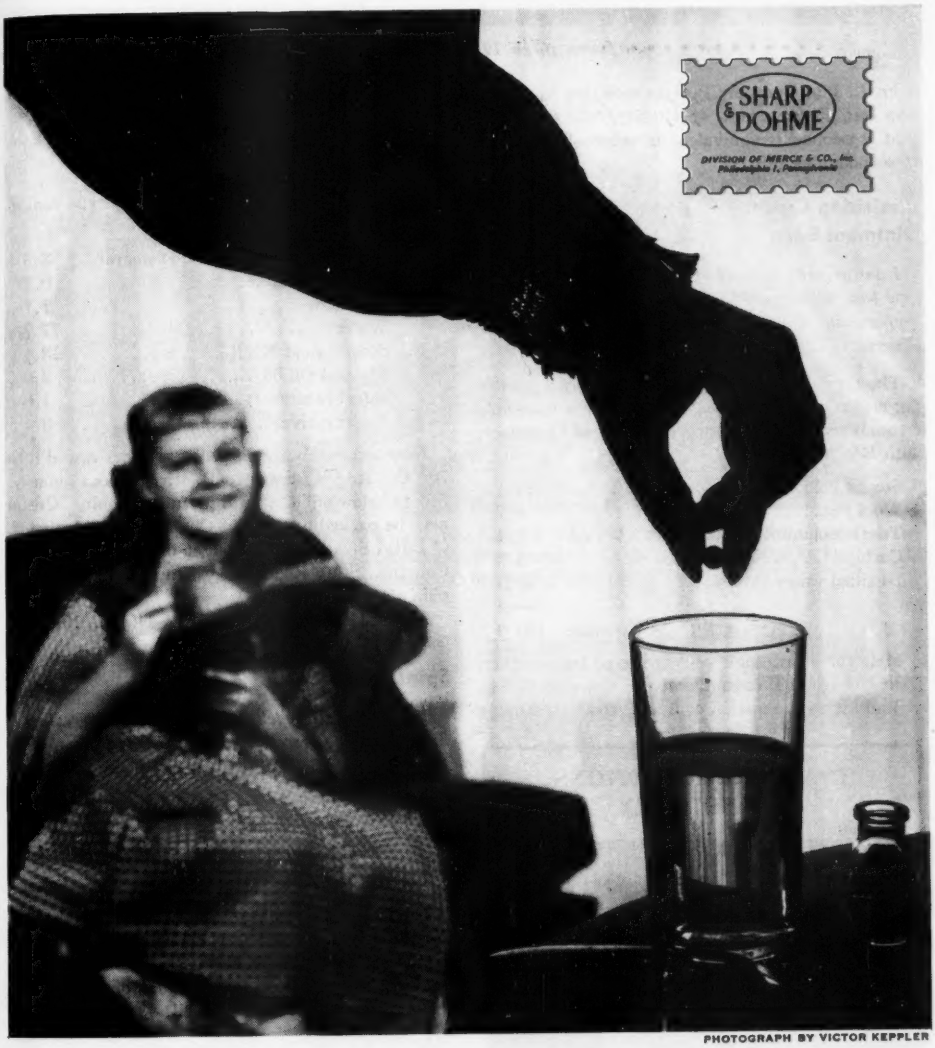
Introduction into subcutaneous tissue of this solution, with or without an equal volume of 5% glucose solution, in doses of 10–20 cc. per lb. body weight, once or twice a day, often produces great improvement in gastroenteritis in children if signs of dehydration develop. The solution may be given by intravenous drip, 40 to 70 ml. per lb. body weight during 8 to 12 hours, with 5% glucose solution.

Buscopan Tablets

What are Buscopan tablets? They are prescribed in Germany for the relief of gallbladder pain.—C. T., Washington, D. C.

Buscopan tablets contain butylscopolammonium bromide (butylscopolamine HBr) 10 mg. They are manufactured by Boehringer Sohn, Wilder-Ingel-

(Continued on page 200)



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Reference: 1. J.A.M.A. 151:347, 1953.

This advertisement is appearing in current medical journals as part of Sharp & Dohme's promotion to the profession.

℞ Information Service

• • • • • • • • • • • • *from page 198*

heim A. Ph., Germany. A comparative investigation (see *Chem. Abstr.*, **46**, 10427*f*, 1952) indicates that Buscopan is equivalent in spasmolytic action to scopolamine HBr.

Vanishing Cream Ointment Base

I am urgently in need of a formula for a greaseless type base which may be used for the extemporaneous preparation of dermatologic prescriptions.—H. W., Georgia

The type of base you desire is probably a vanishing cream. The following formula for a vanishing cream is given in Remington's Practice of Pharmacy, 10th Ed., p. 1474:

Stearic acid	26.1
Wool Fat	4.7
Triethanolamine	1.4
Carbitol*	8.8
Distilled water	59.0
To make	100.0

Melt the stearic acid and the wool fat together. Heat the triethanolamine and the water to 95° C. and add it to the melted acid and wool fat, stirring constantly. Mix the desired perfume with the Carbitol, add this to the mixture, and continue stirring until cool, being careful not to beat too much air into the cream. (* Carbitol is monoethyl ether of diethylene glycol, marketed by Carbide and Carbon Chemicals Corp., 30 E. 42nd St., New York 17, N. Y.)

The following formula yields a pearly type vanishing cream:

A.	Polyethylene Glycol 200 Distearate	3.5
	Triethanolamine	0.7
	Glycerin	1.7
	Water	77.7
B.	Stearic Acid XXX	13.4
	Mineral Oil 65/75	2.0
	Butyl Stearate*	1.0
	Preservative	0.1

Heat separately the ingredients under A and B to 70° C. Add A slowly to B, stirring continuously. Stir to below 35° C. Add perfume to suit. Cream may be packed at 30°–35° C. Avoid rapid stirring. (* Butyl Stearate is a product of Kessler Chemical Co., Inc., State Road and Cottman Ave., Philadelphia 35, Pa.)

Also see THIS JOURNAL, **15**, 32–44(Jan., 1954).

Spirit Sapon Calcis

Would you please tell me what the third ingredient is in the following prescription for a German shampoo:

Liquor carbonis detergens, 15 cc.
Petroleum ether, 20 cc.
Spirit sapon calcis q.s.

What would be the closest U. S. P. preparation?—J. F., Arlington, Va.

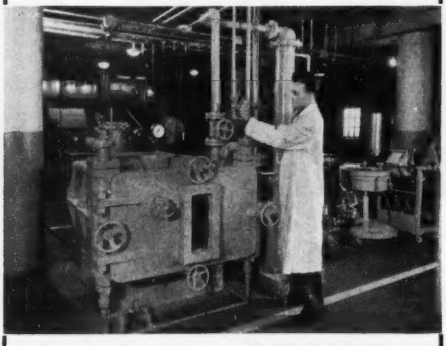
The German Pharmacopeia (Dt. Arzneibuch) lists *Spiritus saponicus kalini*, which consists of one part "Kaliseife" and one part alcohol. "Kaliseife" (Sapo Labinus) must contain at least 40% of fatty acids; the Arzneibuch gives linseed oil, 43; "Kalilauge," 58; and alcohol, 5 parts. "Kalilauge" (Liquor Kalicaustici) contains 15% potassium hydroxide (in water). The U. S. P. item most closely resembling Spiritus saponicus kalini is soft soap liniment.

Analgesic Liniment

Can you send me a formula for an analgesic liniment?—R. D., New York, N. Y.

Two formulas for "analgesic liniment" are given in The Pharmaceutical Recipe Book, 3rd ed., p. 70. Other liniments are given on pages 64 to 71. One analgesic liniment contains menthol, 45; olive or peanut oil, 300; oil of camphor, 250; methyl salicylate, *q. s.* 1000. Mix the oil of camphor and 200 cc. of methyl salicylate and in this dissolve the menthol. Add the vegetable oil and sufficient methyl salicylate to make 1000 cc.

TRAIN FOR POSITIONS IN INDUSTRY



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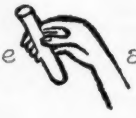

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Giacomello, Giordano, Rome, Italy
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Deceased Members

Frailey, Carson P., Washington, D. C., March 13, 1954
Haskell, Charles C., Richmond, Va.
Kelley, Ray Stanley, Newton Highlands, Mass., March 13, 1954
Simonds, Chester M., Priest River, Idaho, August, 1953
Wilcox, W. D., Philadelphia, Pa., March 9, 1954
Wilson, Ralph A., Birmingham, Mich., Feb. 14, 1954

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RECENT

PROGRESS IN MEDICINE

Treatment of Hodgkin's Disease and Lymphosarcomas

Irradiation, triethylene melamine, and nitrogen mustard are usually the most effective therapeutic measures available for Hodgkin's disease, lymphosarcoma, follicular lymphoblastoma, and reticulum cell sarcoma, Dr. Ovid O. Meyer states in his review of the therapy of these conditions. The cause of Hodgkin's disease is still unknown and there is no known cure for it, but the available therapeutic agents are efficacious in controlling symptoms of the afflicted. In most cases, irradiation is the therapy of choice for all of the above conditions. Occasionally, with extensive systematic disease, nitrogen mustard or triethylene melamine, especially the latter, may be the therapy of choice in Hodgkin's disease.

[Meyer, O. O., *J. Am. Med. Assoc.*, **154,** 114(Jan. 9, 1954).]

Quinacrine in Chronic Discoid Lupus Erythematosus

Administration of quinacrine hydrochloride (Atabrine), 100 mg. twice daily for two weeks and 100 mg. daily thereafter, to 32 patients with chronic discoid lupus erythematosus (a superficial cutaneous inflammation) caused complete clearing of lesions in 12; 50 per cent improvement in 15; while five patients were not benefitted. Two instances of toxic reaction were noted: a severe eczematoid dermatosis after three months of therapy; and a mild transitory eruption after four months of therapy. In those cases that will be helped by quinacrine, the effects of the drug are usually rapid and dramatic, with maximum response within three to four months. It is also noted that fewer toxic reactions are to be expected if therapy is not continued beyond the four-month period.

[Cole, H. N., Jr., Chivington, P. V., Jr., Cole, 15. N., and Driver, J. R., *J. Am. Med. Assoc.*, **153,** H15(Dec., 1953).]

Entozyme in Treatment of Psoriasis

Twenty-four recalcitrant cases of psoriasis treated only by oral administration of Entozyme, 3 to 4.5 Gm. daily, showed good response in 19 cases within four weeks to three months, according to a report by Dr. A. E. Ingels. In four of these cases, the skin cleared completely. In 11 of 12 cases in which local treatment was supplemented by Entozyme, lesions cleared in two weeks to three months or longer. Four patients reported aggravation of chronic constipation, and in two cases the psoriasis was aggravated during therapy with the Entozyme (enteric-coated tablets containing pepsin 250 mg., pancreatin 300 mg., and bile salts 150 mg.).

[Ingels, Arne E., *Calif. Med.*, **79,** 437 (1953).]

Chemotherapy of Tuberculosis

A concise report to the A.M.A. Council on Pharmacy and Chemistry, prepared by Dr. D'Esopo, includes reviews on the therapeutic applications of streptomycin and para-aminosalicylic acid, dihydrostreptomycin, isoniazid, oxytetracycline (Terramycin) and viomycin, amithiozone (Tibione), pyrazinamide (Aldinamide), and certain antibiotics. Other aspects of chemotherapy are discussed.

[D'Esopo, N., *J. Am. Med. Assoc.*, **154,** 52(Jan. 2, 1954).]

New Blood Factor U

A blood transfusion that caused death due to a hemolytic reaction led to the discovery of a new blood factor named factor U. This factor was found to be present in all of the 690 Caucasoids tested and was absent in four of 425 Negroids tested, as well as in the deceased Negroid patient. The growing complexity of blood grouping requires the skill of specially trained persons, and the performance of grouping and cross-matching tests should not be delegated to interns.

[Wiener, A. S., Unger, L. J., and Gordon, E. B., *J. Am. Med. Assoc.*, **153,** 1444(Dec. 19, 1953).]

(Continued on page 206)

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Progress in Medicine

• • • • • • • • • • • • *from page 204*

Glands Stimulated by Amino Acids of Food

Discovery that some of the body's glands, such as those that produce anti-arthritis cortisone and ACTH, may be stimulated by the amino acids that build high-quality protein food is announced by two Finnish doctors in a report to the Endocrine Society here.

Test meals of casein and tyrosine lowered the number of eosinophils circulating in the blood of healthy persons. The effect was much weaker with a test meal of gelatin. American scientists have already shown that the number of eosinophils in the blood is decreased by ACTH from the pituitary gland. Presumably this is because ACTH increases the production of adrenal gland hormones such as cortisone. Epinephrine, another adrenal gland hormone, causes a similar decrease in eosinophil cells.

[Vartiainen, I., and Apajalahti, J., *J. Clin. Endocrinology and Metab.*, **13,** 1502(1953).]

Levophed Useful in Severe Shock Cases

l-Arterenol (Levophed), administered by continuous infusion, aided the recovery of six out of seven patients suffering from severe shock accompanying myocardial infarction, despite a diagnosis of congestive heart failure, according to a report by three physicians. In five additional patients in the same condition, immediate pressor responses were obtained with another sympathetic amine but the blood pressures failed to stabilize. The doctors also observed an increase of contractile force in seven patients with signs of congestive heart failure in addition to shock when *l*-arterenol was administered. In these patients there was an almost immediate clearing of pulmonary congestion, increase in intensity of heart tones, increase in pulse pressure, and decrease of distension of arm and neck veins.

[Gazes, P. C., Goldberg, L. I., and Darby, T. D., *Circulation*, **8,** 883(Dec., 1953).]

Leukopenia following Fumagillin Therapy

A case of mild leukopenia following administration of 40 mg. of fumagillin daily for 14 days is reported. This case history was published because fumagillin an amebacide that is produced from *Aspergillus fumigatus*, is generally well tolerated and toxic effects on parenchymatous organs including the blood and blood-forming tissues had not been reported previously.

[Malewitz, E. C., *J. Am. Med. Assoc.*, **153,** 1446 (Dec. 19, 1953).]

Obesity and Heart Disease

Studies by three New York physicians of the relation of obesity to coronary disease and hypertension indicate that, although obesity occurs more commonly in patients with hypertension or coronary disease, no definite relationship can be drawn. The physicians found a definite increase in the relative frequency of overweight in men with coronary disease, and that overweight occurred more frequently among men with hypertension than among the general population. In women, obesity was not more frequent than in the normal population. The physicians repeat that obesity should be avoided in cardiovascular disease.

[Master, A. M., Jaffe, H. L., and Chesky, K., *J. Am. Med. Assoc.*, **153,** 1499(Dec. 26, 1953).]

Effect of Isoniazid on Emotions

Early reports on the use of isoniazid in the treatment of tuberculosis indicated a definite euphoric emotional effect on the patients. Recent studies show that neither consistent nor significant emotional changes are attributable to the drug *per se.*

[Editorial, *J. Am. Med. Assoc.*, **153,** 1524(Dec. 26, 1953).]

Results of Gamma Globulin Test for Polio

The mass inoculations of some 250,000 children during the 1953 poliomyelitis season did not yield results that indicated beneficial effects. Insufficient information was obtained to enable an evaluating committee, selected by the Public Health Service, Department of Health, Education, and Welfare, to conclude whether or not gamma globulin had an effect in preventing or alleviating the disease when it was administered to subjects who had come into contact with diagnosed polio cases. Additional tests are planned for 1954.

[*Science Service* (Feb. 19, 1954).]

Bactericidal Effects of Hot Oils

The bactericidal effectiveness of several ordorless nonvolatile oils when heated is reported by H. T. Knighton. Spores of stock cultures were killed two to three times as fast for each 10° rise in the temperature of the oils between 130° to 160°. Partially dry nonspore-forming bacteria were killed twice as fast for each 10° rise from 120° to 140°. It required 160° hot oil to surpass 100° water in rapidity of sporicidal effectiveness. It was necessary to heat oil at 150° to kill relatively dry nonspore-forming bacteria within one minute. The oils (silicone, Whip Mix 20, Castle—"no odor," Kadex, Whip Mix—mineral oil) showed similar actions.

[Knighton, H. T., *J. Am. Dent. Assoc.*, **48,** 307 (March, 1954).]

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BRAND OF OXYTETRACYCLINE

TERRAMYCIN OINTMENT
with Polymyxin B Sulfate

Top treatment for local infections— 1 oz. and ½ oz. tubes, shelf packs of 10

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TERRAMYCIN INTRAMUSCULAR

The first and only broad-spectrum antibiotic for this route of administration— 100 mg. vials

Be sure you're stocked with these three concentration products

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Division, Chas. Pfizer & Co., Inc.

FDA CRIMINAL PROSECUTION ACTIONS TERMINATED IN FEBRUARY

Over-The-Counter Sales of Prescription Drugs

Washington, D. C.—Sold barbiturates without physicians' prescriptions. Two defendants, each fined $1,000, given a three-month suspended jail sentence, and placed on probation for six months.

Boise, Id.—Sold barbiturates, sulfonamides, and penicillin without physicians' prescriptions. Two defendants, each given a four-hour suspended jail sentence.

Eagle, Id.—Sold barbiturates, sulfonamides, penicillin, and dihydrostreptomycin without physicians' prescriptions. Given a five-hour suspended jail sentence.

Chicago, Ill.—Sold barbiturates and Methylparafynol without physicians' prescriptions. Fined $250 and court costs of $38.40.

Kansas City, Kans.—Sold amphetamine and barbiturates without physicians' prescriptions. Two defendants, each fined $100 and placed on probation for two years.

Idabel, Okla.—Sold sulfonamides and Acetebar without physicians' prescriptions. Two defendants, one fined $50 and the other $75.

Idabel, Okla.—Sold sulfonamides without physicians' prescriptions. Two defendants, one fined $50 and the other $75.

Idabel, Okla.—Sold amphetamine and sulfonamides without physicians' prescriptions. Two defendants, one fined $100, and the other $50.

Reading, Pa.—Sold sulfonamides without physicians' prescriptions. Fine $480.

Misbranded Drugs and Devices

American White Cross Laboratories, Inc., New Rochelle, N. Y.—Adhesive bandages were nonsterile. Fined $1,600 each.

Addison Laboratories, Philadelphia, Pa.—Testosterone and Lynntestro were contaminated with viable microorganisms; the strength of estrone differed from that which it was purported to possess. Fined $300 and placed on probation for two years.

"Orgone Energy" devices misbranded—The Food and Drug Administration, U. S. Department of Health, Education, and Welfare, which initiated the suit, has announced that "orgone energy" devices misbranded with curative claims have been barred from interstate commerce by a permanent injunction order issued March 19, 1954, in the Federal district court at Portland, Me. Those enjoined from distributing the devices are Dr. Wilhelm Reich and his wife, Ilse Ollendorff Reich, and an alleged nonprofit-making corporation, the Wilhelm Reich Foundation, all of Rangeley, Me. The decree was issued in default of contest by the defendants.

Dr. Reich, once prominently associated with Dr. Sigmund Freud in Vienna, claims discovery of so-called "orgone energy," which he declares in his voluminous literature will prevent and cure a variety of serious diseases, including cancer. After entering the United States in 1939, he invented the "Orgone Energy Accumulator" and produced it in several models. The most widely distributed model is a cabinet a little smaller than a telephone booth, constructed of alternate layers of wood, metal, and glass and steel wool, with no electrical or other energy connections. This box is supposed to accumulate the "orgone energy" from the atmosphere. The patient sits in the box and the allegedly stored up energy is supposed to enter his body and cure his ailments.

Antibiotics for Agricultural Use

Oveta Culp Hobby, secretary, Department of Health, Education, and Welfare, announces that under section 507 (a) and (c) of the Federal Food, Drug, and Cosmetic Act, an article that contains one or more of the antibiotic substances described in the aforementioned section, and intended solely for application to plants for the control of plant diseases caused by microorganisms and conspicuously so labeled is not subject to the requirements of sections 502 (1) and 507 of the Act, if it contains one or more suitable denaturants that make it unfit for drug use. However, it shall not be exempt from the requirements of these sections if it is represented or intended to be administered to man or other animals for the cure, mitigation, treatment, or prevention of disease or as an animal feed supplement.

New Subscription Rates

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

Effective July 1, 1954

Annual Subscription:	Domestic (Canada-Spain Philippines & Pan America)	Foreign
Practical Pharmacy Edition	$5.00	$6.00
Scientific Edition	6.00	7.00
Combined rate (both Editions)	10.00	12.00
Single Copies:		
Practical Pharmacy Edition	.50	.60
Scientific Edition	.60	.70

Hypodermic Syringe Exhibit

The story of the hypodermic syringe is told in an exhibit which has just opened in the Smithsonian Institution's Division of Medicine and Public Health. Credit for the development of this highly important medical device goes back to Sir Christopher Wren. In 1656 Wren devised a syringe consisting of a quill fastened to a bladder and used it for making injections of opium into the veins of dogs and human beings.

According to George Griffenhagen, Smithsonian curator who assembled the new exhibit, it is not known with certainty who devised the first hypodermic syringe as we know it today. As early as 1827, A. Neuner, a German physician, fashioned a syringe for use in cataract operations, and in 1844 Francis Rynd of Dublin, Ireland, introduced a special instrument for the subcutaneous introduction of fluids in the relief of neuralgia. However, Charles-Gabriel Pravaz of Lyons, France, is most often credited with the "invention" of the hypodermic syringe in 1853, even though his syringe was not unlike that of Neuner's.

It was not until 1859 that Charles Hunter of London, England, devised the point on the hypodermic syringe needle. Before that time syringe needles were blunt. One American physician described his use of the hypodermic syringe in the *Boston Medical and Surgical Journal* of 1859 as follows: "I dissolved a grain of morphia in about a half teaspoonful of cold water, then made a puncture with a lancet into the cellular tissue of the left arm. . . . I then introduced the syringe as far as I could. . .then pushed the piston home. The solution whizzed in, forming an areola around the puncture, about the size of a dollar; withdrawing the syringe, I pressed a moment on the puncture and then applied a little adhesive plaster to prevent the solution oozing out."

The first hypodermic syringe to be granted a patent in the U. S. Patent Office was that of Dr. Ephraim Cutter in 1873, and in 1875 Joseph Leiter, of Vienna, Austria, received a U. S. patent for the first automatic spring syringe.

The Smithsonian exhibit, sponsored by Becton, Dickinson, & Co., of Rutherford, N. J., displays the largest (100-cc.) and the smallest ($^1/_4$-cc.) hypodermic syringes manufactured today.

DEPENDABLE DRESSINGS
for FIRST AID, for EMERGENCY
for DISASTER, for DEFENSE
With a distinguished record of use by the medical services of the Armed Forces, by other governmental agencies, by hospitals, by emergency and disaster units, by industrial clinics and first-aid stations . . .
Now in three sizes:
No. 1: 3" x 36" (6 in carton)
No. 2: 3" x 18" (12 in carton)
No. 3: 6" x 36" (6 in carton)
Vaseline
Petrolatum Gauze Dressing
Sterile
VASELINE STERILE PETROLATUM GAUZE DRESSINGS
...always STERILE, always READY for immediate and easy application to dress a burn, an abrasion, and other surface injuries.
have been adopted by surgeons as standard procedure, by nurses as preferred matériel, by professionally-trained aid personnel as the compact, ready-made, ready-to-apply dressing of their choice.
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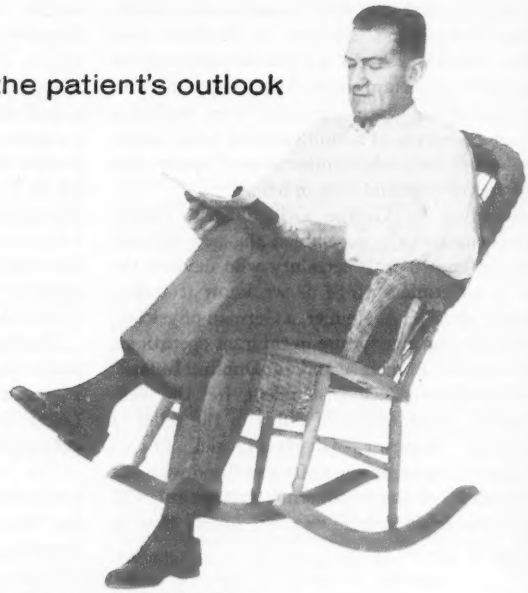
Available through your Local Wholesaler or our Sales Representative, the Colgate-Palmolive-Peet Co.
VASELINE IS THE REGISTERED TRADE-MARK OF THE CHESEBROUGH MFG. CO., CONS'D

prescribed to brighten the patient's outlook



AMPHEDASE* KAPSEALS*

NEW antidepressant and nutritional adjunct

When depression, fatigue, and faulty food intake threaten to prolong convalescence, AMPHEDASE is prescribed as a valuable adjunct. The patient's mood is elevated and attendant fatigue lessened.

In ordering stock, remember the many indications for which physicians are prescribing AMPHEDASE: asthenia, convalescence, depression, chronic alcoholism, geriatric therapy, and faulty nutrition.

each AMPHEDASE Kapseal contains:

d-amphetamine sulfate	2.5 mg.
Nicotinamide	25.0 mg.
Thiamine hydrochloride	5.0 mg.
Ascorbic acid	50.0 mg.
Taka-Diastase	300.0 mg.

Supplied in bottles of 100 and 500 Kapseals.

More detailed information on AMPHEDASE is available from the Parke-Davis sales representative who calls on you.

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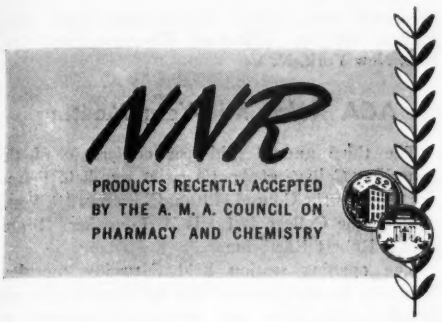

New Policy for Presenting N.N.R. Information

In order to give pharmacists more complete coverage, the important information made available by the A.M.A. Council on Pharmacy and Chemistry will be presented with the cooperation of the Editor of the *Journal of the A.M.A.* in the *Scientific Edition* as well as the *Practical Pharmacy Edition*, starting with the April issues of THIS JOURNAL. All A.PH.A. members receive both issues of THIS JOURNAL. Those members who have clipped the N.N.R. monographs in the past will find the arrangement of this material in the *Scientific Edition* suitable for continuing this practice.

Complete N.N.R. monographs will be published in the *Scientific Edition* as soon as they become available. Summary notices of this material with correlating references, will appear in the corresponding issue of the *Practical Pharmacy Edition*.

The *Practical Pharmacy Edition* will also report additional N.N.R. information of immediate value to pharmacists.

N.N.R. MONOGRAPH ABSTRACTS

[For detailed monographs on the following items see THIS JOURNAL, *Scientific Edition*, **43**, III, V, VII (April, 1954).]

ABSORBABLE GELATIN FILM.—Gelfilm (Upjohn).—A sterile, nonantigenic, absorbable, water-insoluble gelatin film. Gelfilm—Box of six films in individual sterile envelopes; single films are approximately 100 x 125 x 0.16 mm.

QUININE CARBACRYLIC RESIN. — Diagnex (Squibb).—The quinine salt of a polyacrylic carboxylic acid resin containing about 1.85% of quininium ion. The amount of liberated quinine determined in the urine indicates the amount of free hydrochloric acid in the stomach. Granules Diagnex: A quininium indicator resin, each test containing a 2-Gm. packet of resin and a 0.25-Gm. capsule of caffeine and sodium benzoate.

DEXTRAN.—Expandex (Commercial Solvents).—Gentran (Baxter).—Plavolex (Wyeth).—Dextran is a water-soluble, high molecular weight (about 75,000) glucose polymer produced by the action of *Leuconostoc mesenteroides* on sucrose. It is administered intravenously in a 6 per cent solution in isotonic sodium chloride to expand plasma volume. Solution Dextran 6% (Abbott) (Hyland), Solution Expandex 6%, and Solution Gentran 6% are available in 250- and 500-cc. bottles of isotonic solution containing 60 mg. of dextran in each cc., with or without a disposable syringe. Solution Plavolex 6% is available in 500-cc. bottles.

NEOMYCIN SULFATE.—Mycifradin Sulfate (Upjohn).—Neomycin is a stable, water-soluble antibiotic. Ointment Neomycin Sulfate (Eli Lilly) contains 5 mg. of neomycin sulfate in each Gm. of ointment available in 14.2-, 28.4-, and 113.4-Gm. tubes. Ophthalmic Ointment Neomycin Sulfate (Eli Lilly) contains 5 mg. of neomycin sulfate in each Gm. of ointment available in 3.54-Gm. tubes. Powder Mycifradin Sulfate (Upjohn)—0.5-Gm. vials. Tablets Mycifradin Sulfate (Upjohn)—0.5-Gm.

NITROFURANTOIN.—Furadantin (Eaton).—N-(5-Nitro-2-furfurylidene)-1-aminohydantoin exhibits antibacterial activity against many Gram-positive and Gram-negative microorganisms. Tablets Furadantin (Eaton)—50- and 100-mg.

ADDITIONAL ARTICLES ACCEPTED FOR ADMISSION TO N.N.R.

Acet-Dia-Mer-Sulfonamides.

Tablets Cetazine: 0.5-Gm. Each tablet contains 0.167 Gm. each of sulfacetamide, sulfadiazine, and sulfamerazine. The Bowman Bros. Drug Co., Canton, Ohio.

Suspension Buffonamide with Sodium Citrate: 473-cc. and 3.78-liter bottles. A suspension containing 33 mg. each of sulfacetamide, sulfadiazine, and sulfamerazine, and 0.1 Gm. of sodium citrate in each cc. Preserved with 0.75% methylparaben and 0.25% propylparaben. S. J. Tutag & Co., Detroit, Mich.

Alkavervir—*Tablets Veriloid:* 1-, 2-, and 3-mg. Riker Laboratories, Inc., Los Angeles, Calif.

***p*-Aminosalicylic Acid**—*Powder para-aminosalicylic Acid:* Bulk; for manufacturing use. American Roland Corp., New York, N. Y.

Chlorotrianisene—*Oral Drops TACE:* 30-cc bottles. A flavored solution in vegetable oil containing 12 mg. of chlorotrianisene in each cc. The Wm. S. Merrell Co., Cincinnati, Ohio.

Cyanocobalamin—*Solution Crystalline Vitamin B_{12} with Benzyl Alcohol 2%:* 10-cc. vials. A saline solution containing 30 or 50 mcg. of cyanocobalamin in each cc. Standard Pharmaceutical Co., New York, N. Y.

Estrone U. S. P.—*Solution Estrone in Oil with Benzyl Alcohol 2%:* 10-cc. vials. A solution in sesame oil containing 0.5 mg. of estrone in each cc. Lincoln Laboratories, Inc., Decatur, Ill.

Heparin Sodium U. S. P.

Solution Heparin Sodium: 1-cc. vials. A solution containing 20,000 U. S. P. units (approximately 200 mg.) of heparin sodium in each cc. Preserved with 0.4% chlorobutanol. The Upjohn Co., Kalamazoo, Mich.

(Continued on next page)

N.N.R.

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Solution Heparin Sodium: 10-cc. vials.—A solution containing 1,000 U. S. P. units (approximately 10 mg.) or 5,000 U. S. P. units (approximately 50 mg.) of heparin sodium in each cc. 4-cc. vials—A solution containing 10,000 U. S. P. units (approximately 100 mg.) of heparin sodium in each cc. Preserved with 0.5% phenol. The Vitarine Co., Inc., New York, N. Y.

Mercurophylline Sodium

Powder Mercurophylline Sodium: Bulk; for manufacturing use. Chemo Puro Manufacturing Corp., Long Island City, N. Y.

Solution Mercurophylline (Sodium): 2-cc. ampuls. A solution containing 140 mg. of mercurophylline sodium (equivalent to 39 mg. of mercury) in each cc. Premo Pharmaceutical Laboratories, Inc., South Hackensack, N. J.

Sodium *p*-Aminosalicylate—*Powder Sodium para-aminosalicylate:* Bulk; for manufacturing use. American Roland Corp., New York, N. Y.

Tripelennamine Hydrochloride U. S. P.—*Solution Pyribenzamine Hydrochloride:* 1-cc. ampuls. A solution containing 25 mg. of tripelennamine hydrochloride in each cc. *Tablets Pyribenzamine Hydrochloride:* 25-mg. Ciba Pharmaceutical Products, Inc., Summit, N. J.

Aminophylline U. S. P.—*Tablets Aminophylline:* 0.19-Gm. Rexall Drug Co., Los Angeles, Calif.

Amphetamine Sulfate U. S. P.—*Tablets Amphetamine Sulfate:* 10-mg. Lincoln Laboratories, Inc., Decatur, Ill.

Ascorbic Acid, U. S. P.—*Tablets Ascorbic Acid:* 25-, 50-, and 100-mg. Standard Pharmaceutical Co., Inc., New York, N. Y.

Bacitracin—*Bacitracin (Parenteral):* 50,000-unit vials. Pfizer Laboratories, Div. of Chas. Pfizer & Co., Inc., Brooklyn, N. Y.

Benzpyrinium Bromide—*Solution Stigmonene Bromide 1:500:* 1-cc. ampuls. A buffered, saline solution containing 2 mg. of benzpyrinium bromide in each cc. Warner-Chilcott Laboratories, New York, N. Y.

Cortisone Acetate—*Tablets Cortisone Acetate:* 5- and 10-mg. The Upjohn Co., Kalamazoo, Mich.

Dia-Mer-Sulfonamides—*Tablets Sulmeradine:* 0.5-Gm. Each tablet contains 0.25 Gm. each of sulfadiazine and sulfamerazine. Physicians' Drug & Supply Co., Philadelphia, Pa.

Folic Acid U. S. P.—*Tablets Folic Acid:* 5-mg. Rexall Drug Co., Los Angeles, Calif.

Hexamethonium Chloride—*Tablets Methium Chloride:* 0.5-Gm. Warner-Chilcott Laboratories, Inc., New York, N. Y.

Sodium Ascorbate—*Solution Sodium Ascorbate:* 2-cc. and 5-cc. ampuls. A sterile aqueous solution containing sodium ascorbate equivalent to 50 mg. and 100 mg., respectively, of ascorbic acid in each cc. Preserved with 0.4% chlorobutanol and 0.2% sodium bisulfite. Standard Pharmaceutical Co., Inc., New York, N. Y.

ACA Holds Mid-Year Meeting

The third annual mid-year conference of the American College of Apothecaries was held February 20–21 at the Conrad Hilton, Chicago, Ill. President of the College is Louis B. Longaker. Secretary is Robert E. Abrams.

The opening session held Saturday morning, February 20, and presided over by Edward Keating, F.A.C.A., was given over to a panel discussion on "Promoting and Improving Your Pharmacy." Included was a visual program showing ideas and material which have been proved successful by pharmacists from various parts of the country.

The Saturday afternoon session was opened by William Arscott, vice-president in charge of sales, E. R. Squibb and Sons, who presented a special report on the National Pharmaceutical Council Inc. This was followed by a panel discussion on "Pharmaceutical Economics" and comprised the following subjects: "Detailing the Physician," "What Lies Ahead," "Pricing and Profit," and "Inventory Control."

A banquet was held on Saturday evening, February 20, at which the guest of honor was Dr. Francis Schwarzenberg, associate professor, Department of Political Science, University of Loyola. This session was concluded with a round table discussion, limited to operators of prescription pharmacies, on various problems concerning the retail practice of pharmacy.

The session on Sunday morning, February 21, was presided over by Berj. M. Varzhabedian, F.A.C.A., and was devoted to a panel discussion on "Methods of Increasing Store Volume." The final session, held that afternoon, was presided over by Royal S. Dudley, F.A.C.A., and encompassed a panel discussion on "Professional Psychoanalysis Clinic."

Dr. Powers Honored

Justin L. Powers was recently elected an honorary member of the Colegio de Farmaceuticos del Estado Zulia, Venezuela. Dr. Powers also holds membership in L'Académie de Pharmacie (France), Asociacion Farmaceutica Nacional de Nicaragua, Academia Nacional da Farmacia (Brazil), Instituto Brasileiro de Historia de Medicina e das Ciencias Afins, Sociedade Brasileira de Quimica, Colegio de Farmaceuticos de Rosario (Argentina), and College des Pharmaciens de la Province de Quebec. Honorary membership in these organizations, with the exception of L'Académie de Pharmacie, was predicated on his activities as a delegate to the First Pan American Congress on Pharmacy held in Havana, Cuba, in 1948.

Every patient with essential hypertension can benefit from this new Dorsey Product

Rautensin

Because of its unique clinical behavior, Rauwolfia serpentina has created unusually wide interest in the field of hypertension therapy. A tropical plant found in India, Rauwolfia serpentina lowers blood pressure moderately, relaxes the emotionally tense patient, and slows the pulse. It also leads to striking relief from the troublesome symptoms associated with hypertension—headache, tinnitus, and dizziness.

All of these desirable features are exhibited by Rautensin, a highly purified alkaloidal extract of Rauwolfia serpentina—the alseroxylon fraction. This substance is tested in dogs for its ability to reduce blood pressure, slow the pulse, and produce sedation. Each Rautensin tablet contains 2 mg. of alseroxylon.

In mild and moderate hypertension, Rautensin suffices as the sole therapy. In more severe hypertension, it appears to act synergistically with more potent hypotensive agents, such as Veratrum viride.

Initial dose, 2 tablets (4 mg.) daily for 30 to 60 days; maintenance dose, 1 tablet (2 mg.) daily. Supplied in 100's, 500's, and 1000's.

INTENSIVELY PROMOTED TO THE MEDICAL PROFESSION

Rautensin will be widely and intensively promoted to the medical profession by detail representatives, direct-by-mail and journal advertising. Prior to the national advertising campaign, which begins March 1, 1954, wholesalers will be adequately stocked.

Order an adequate supply of Rautensin from your regular wholesaler, because our promotion will result in profitable business for you.

SMITH-DORSEY LINCOLN, NEBRASKA

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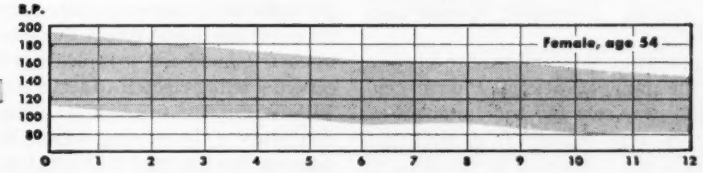
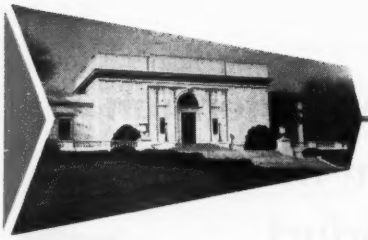


Weeks of therapy. Rautensin, 4 mg. daily. Marked subjective improvement.



STRAIGHT FROM HEADQUARTERS

ROBERT P. FISCHELIS, EDITOR

National Pharmaceutical Council Selects Stewart

THE announcement by Dr. Theodore G. Klumpp, president of the recently organized National Pharmaceutical Council that Newell Stewart has been elected to the full-time position of executive vice-president of that organization and that John W. Dargavel, secretary of the N.A.R.D., has accepted the chairmanship of its Advisory Committee indicates that we may look forward to early activation of the program formulated by the pharmaceutical manufacturers constituting this new organization.

Dr. Klumpp is also president of Winthrop-Stearns, Inc. which is one of the twelve firms constituting the National Pharmaceutical Council. The other announced members are: Abbott Laboratories; Ciba Pharmaceutical Products, Inc.; Hoffmann-La Roche Inc.; Lederle Laboratories; McNeil Laboratories, Inc.; The William S. Merrell Co.; Chas. Pfizer and Co., Inc.; G. D. Searle and Co.; Smith, Kline & French Laboratories, Inc.; E. R. Squibb and Sons, and The Upjohn Company.

The other officers of the Council are: Vice-Presidents: W. L. Arscott, E. R. Squibb and Sons; L. J. Barrett, Chas. Pfizer and Co.; O. J. May, Smith, Kline and French Laboratories; F. P. O'Brien, G. D. Searle and Co.; Henry Wendt, Jr., Lederle Laboratories; Secretary: J. F. Bradley, The William S. Merrell Co.; Treasurer: L. J. Sichel, Ciba Pharmaceutical Products, Inc.; Chairman of the Executive Committee: C. K. Raiser.

It is important at this juncture to keep in mind that the name "National Pharmaceutical Council" was selected by the group of manufacturers who organized it and that this Council is not a division or offspring of any existing national professional or trade association in the field of pharmacy or the drug industry. Evidently the organizers felt that their objectives could not be carried out by any existing organization or combination of organizations.

The officers of the National Pharmaceutical Council, the Executive Vice-President, and the Chairman of the Advisory Committee therefore function as individuals and not as representatives of any national associations with which they may be connected or in which they may hold office.

The National Pharmaceutical Council is fortunate in having secured the services of Mr. Newell Stewart as its executive vice-president. He has announced that he will give up the secretaryship of the Arizona Board of Pharmacy and the Arizona Pharmaceutical Association and move to New York about June 1 to open the offices of the new organization there. Mr. Stewart is president-elect of the AMERICAN PHARMACEUTICAL ASSOCIATION and is scheduled to be installed as president at the Boston Convention the week of August 22, 1954. He was chairman of the House of Delegates of the A.PH.A. in 1950–1951.

In a communication to the individual members of the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION, announcing his acceptance of the position of executive vice-president of the National Pharmaceutical Council, Mr. Stewart wrote as follows:

"Mrs. Stewart and I gave the offer much thought and consideration, particularly as its program might affect one of the highest honors it has been my pleasure to have received—being elected to serve the AMERICAN PHARMACEUTICAL ASSOCIATION as its president during the coming term. We also considered the length of that term of office which, you know, is for only a bit more than seven months this time. Although installa-

tion will take place the latter part of August of this year, the term will be completed the middle of April of 1955 due to the change of meeting date.

"The adequate filling of both positions would place a terrific burden upon anyone and I am well aware of that fact. Each position presents a great challenge to one who has dedicated his life to the promotion of all that is for the best in pharmacy. If, as time goes on, it appears that the burden should become too great, I will then, of course, be forced to choose to carry on the National Pharmaceutical Council affairs because of the tremendous potentialities inherent in the National Pharmaceutical Council's long-range program."

Misinformation about Hospital Pharmacy

THE U. S. Food and Drug Administration has been quoted in several places as announcing that hospitals are not required to employ pharmacists.

Those concerned should note in the first place that the Federal Food and Drug Administration has no authority whatever to determine whether a hospital should or should not employ a registered pharmacist. This is a matter of hospital policy and state law.

Where a hospital is too small to operate a pharmacy under the supervision of a registered pharmacist, prescription service is supplied by arrangement with privately conducted pharmacies outside of the hospital, which operate in accordance with state pharmacy laws.

It is a well-known fact that hospitals which operate pharmacies must comply with the same regulations governing the practice of pharmacy in the state in which they are located as apply to other pharmacies in such states. It is a distinct disservice to the public, to hospital administration, and to American pharmacy, for anyone in a responsible position or conducting a responsible publication to mislead people into believing that hospital service for the American people has retrogressed to the point where pharmaceutical service can be given by anyone who is not qualified by education and by law to supply such service.

The plain facts are that any pharmacy located in a hospital which pretends to give adequate hospital service must be operated at all times under the supervision of a registered pharmacist. There are of course provisions for emergency service under the direct supervision of a physician as is the case in the practice of medicine generally.

Those responsible for the misinformation inspired by such headlines as "Federal Law Does Not Require Hospitals to Hire Pharmacists" should correct it.

McBay Appointed Secretary of Scientific Section

IN ACCORDANCE with the By-Laws of the Scientific Section, vacancies occurring in any of the offices of the Section must be filled by the Chairman.

The vacancy in the Scientific Section, due to the untimely death of Professor Ray S. Kelley, has been filled by the appointment of Arthur J. McBay of Boston, Massachusetts. Dr. McBay is a member of the faculty of the Massachusetts College of Pharmacy and has been an active member of the Scientific Section for a number of years.

All correspondence with regard to papers for the Section should be addressed as follows: Dr. Arthur J. McBay, Secretary, Scientific Section, 179 Longwood Avenue, Boston 15, Massachusetts.

Members planning to present papers before the Scientific Section should send titles to Dr. McBay as promptly as possible. Titles and abstracts (not to exceed 200 words) of papers should be filed by May 15, 1954, in order to insure a place on the Section program.

Keeping Track of New Drugs

LAST October in these columns we called attention to one of the publications available to pharmacists to keep them up-to-date on proprietary prescription products.

This month there is presented on page 208 an announcement of a loose-leaf reference publication called "Facts and Comparisons" in which prescription products are listed according to use. This is the product of Erwin K. Kastrup, a practicing pharmacist who was confronted with the necessity of having available, for ready reference, information about specialties. A special feature of this publication is the comparison of listed products on the basis of utility and cost.

(Continued on page 246)

The pharmacist, as a personal adviser to millions of Americans, helps to combat cancer and to protect the public health.

Cancer Crusade in April

More and more the month of April has come not only to symbolize spring, but through the efforts of the American Cancer Society, to entwine hope with the word cancer. For, by its three-pronged program of research, education, and aid to the cancer sufferer, the Society has brought to millions of American people the glad knowledge that cancer is curable if caught in its early stage, diagnosed promptly, and treated adequately.

April is annually designated *Cancer Crusade Month* by the President. The current issue of This Journal devotes its front cover to cancer control and prevention. Pharmacists, from the smallest, most remote pharmacies to the largest, bustling establishments can play an important year-round role in the fight against cancer.

Because of their professional knowledge and alertness, their close contact with streams of people, the confidence in which they are held by the communities they serve, pharmacists have an unexcelled opportunity to stress to the public the vital importance of *early* detection and therefore improved chance of cure.

In the 17th century John Bunyan described consumption as "captain of the men of death." Some 250 years later Sir William Osler commented that the "captain" had been reduced to a lieutenant and "would soon be reduced to the ranks." On a comparative service rating, cancer would now have an assimilated rank of lieutenant-general, at the least.

But, says Dr. C. P. Rhoads, director of the Memorial Center for Cancer and Allied Diseases, while "hope alone cannot dispel the darkness... the solid accomplishments of orderly scientific research are dissipating the shadow of cancer as certainly and as inevitably as the dawn."

It would be less than frank to minimize the shadow. The 227,000 Americans who died of cancer in 1953 attest to its ominous size. Even more poignant are the 73,000 cancer patients who might have been saved last year but were not—because proper treatment began too late. The cancer toll in 1954 is estimated at 230,000—with 530,000 *new* cases expected this year—the equivalent of the entire population of New Hampshire, or Cincinnati or Minneapolis.

With figures like these it comes as no surprise that cancer ranks as the second cause of death in the United States, right on the heels of heart disease.

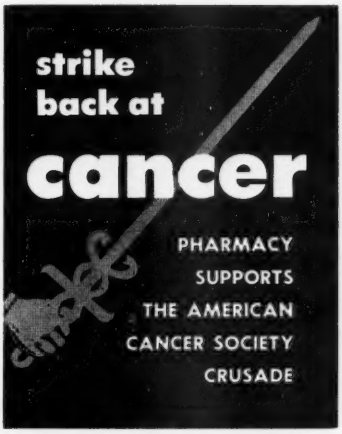
Lightening the picture are the 73,000 Americans saved from cancer in 1953. A simple calculation, however, shows a wide lag between those cured and those who succumbed.

Because cancer is indiscriminate, affecting children as well as men and women, at any age, everyone should learn the 7 "warning signals." These are:

1. Any sore that does not heal.
2. A lump or thickening in the breast or elsewhere.
3. Unusual bleeding or discharge.
4. Any change in a wart or mole.
5. Persistent indigestion or difficulty in swallowing.
6. Persistent hoarseness or cough.
7. Any change in normal bowel habits.

Listings of them are obtainable from any office of the American Cancer Society. Pharmacists can contribute greatly to the health of the public they serve by prominently placing these signals to be seen and recognized by as many people as possible. The appearance of a warning signal may not mean cancer, but it *always* should mean an *immediate* visit to the doctor. Something is wrong somewhere which requires medical counsel and treatment.

The only approved methods of *curing* cancer today are X-ray, radium and surgery. Some hormones, chemotherapy, and certain radioactive



isotopes have proved successful in *treatment* of certain types of cancer. To date the few drugs used are applicable only in limited neoplastic disorders of the blood and lymph systems, as leukemia and polycythemia. They have the important value of making the patient more comfortable and may even induce a temporary remission of symptoms, but are *not* curative.

While the major aim of the American Cancer Society is to find the cause and ultimate cure of this disease, the suffering of many cancer patients is being eased and life extended many months.

Heading the list of measures designed to find early cancer is an annual medical examination for every adult. Strongly recommended are six-months' check-ups for women over 35 and men over 45. With the increase of lung cancer among men, those over 45 are advised to have chest X-rays semiannually. Many lung cancer deaths are avertible by detecting early cancer in chest X-ray screening programs.

To help meet the growing need for doctors trained in cancer diagnosis and treatment, the American Cancer Society is financing such training for 139 young physicians. At the present time 652 cancer clinics, approved by the American College of Surgeons, are operating in the United States. While this is double the number of 10 years ago, it still does not meet today's needs.

The importance of educating the American people about cancer prevention, and of turning out sufficient doctors properly equipped to combat the disease is self-evident. It is dramatically illustrated by the difference between lives now being saved and those that *might be saved* with *early* treatment when the disease was confined to the organ of origin. In breast cancer, the most common form among women, 35% of cures have been achieved—*but* 75% of cures are *possible* and not being accomplished. Skin cancer cures have only a 10% difference with 85% cures achieved, and 95% achievable. Lung cancer shows up with a tragic lag—5% cures and up to 50% curable.

"There is no case of cancer," declares Dr. Charles S. Cameron, medical and scientific director of the American Cancer Society, "no matter how far advanced, in which there is nothing to be done. Expert and properly timed surgical, radiation, and drug therapy may bring comfort to the late cancer patient, and in some instances such palliation may prove to be curative."

About 1,800 scientists are devoting all or part of their time and energies to cancer research. Bernard Baruch once said there are no such things as incurable diseases—only diseases with cures as yet unknown. The American Cancer Society is helping support research by some 900 investigators working in approximately 140 hospitals, universities, laboratories, etc. Cancer research seeks to establish the facts of cell life. It tries to determine how the normal cell lives, grows, ages and dies. Once these facts are known, it will be much easier to learn why the cancer cell never ages and why it never dies until it has killed the host which harbors it.

Almost every branch of science participates one way or another in the research attack on cancer, for example: use of radioactive materials both as methods of treatment and as research tools; use of folic acid antagonists and other compounds which temporarily control leukemia (bear in mind that 3,600 children under 15 died of cancer in 1953); basic research by many branches of science to discover the nature of cancer and what causes it; improved methods of surgery, and many other avenues of approach.

The Goliath of cancer was combated in 1953 by a poor David with a mere $21,500,000 of voluntary contributions at his command. Voluntarily, Americans spent: $9,570,000,000 for alcoholic beverages—*445* times as much as voluntarily spent on cancer control; $5,155,000,000 for tobacco products—*239* times greater than funds spent on cancer control; $1,930,420,000 for toilet articles, etc.—*89* times the amount contributed to cancer control.

The American Cancer Society welcomes the cooperation and assistance of pharmacists the year through, as well as during Cancer Crusade month. With all hands pulling, the "lieutenant general of mortality" can be reduced to the ranks much more quickly.

PAUL REVERE HOUSE—oldest in Boston, built 1660. Paul Revere lived here during 1770–1800.

U. S. FRIGATE CONSTITUTION, "Old Ironsides." Launched in 1797, she was in 40 engagements without defeat.

BOSTON, site of the A.PH.A.

1954 Convention, offers a wide selection of cultural, scientific, historical, recreational, and entertainment facilities.

Not young is Boston. Neither is she old—as cities go. She wears feather boas and taffeta fragrant with lavender. But she also wears Nylon, Dacron and blue mink stoles, and the air about her is redolent, too, of *Numéro 5 de Chanel*. She wears her 300 years with severe dignity. She also wears them with infectious charm. "What she was," wrote Whittier, "is Boston still." The year was 1879, but it might well have been today. She bows to progress, but never has she scraped. It has been a process of infiltration rather than replacement. The old landmarks still stand.

Sight-Seeing

Pictured on these pages are just a few of these landmarks. But here's a tip that's well worth taking:—to get the most out of your stay, take a guided tour. The cost is nominal and you'll go to places and see things it would take a year of Sundays to cover on your own.

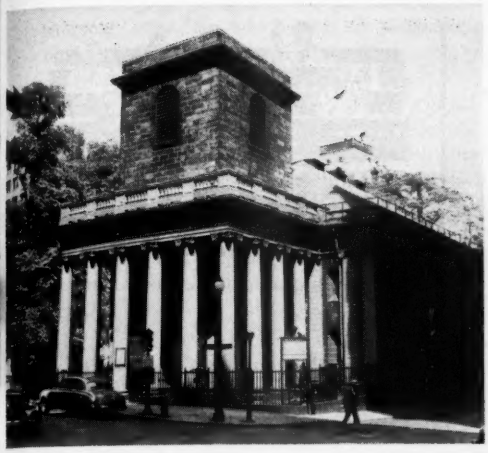
We *stress* it—take a guided tour. For information, call or write the Boston Chamber of Commerce, 80 Federal Street, HAncock 6-8230. Or if you prefer, get in touch direct with a tour service such as the Gray Line, KEnmore 6-2470, or Copley Motor Tours, COmmonwealth 6-3500.

Now mind—this is not intended as a Baedeker. What you may remember from your history courses will give you background material, and the Chamber of Commerce, as well as the local press, will fill you in on matters of current interest.

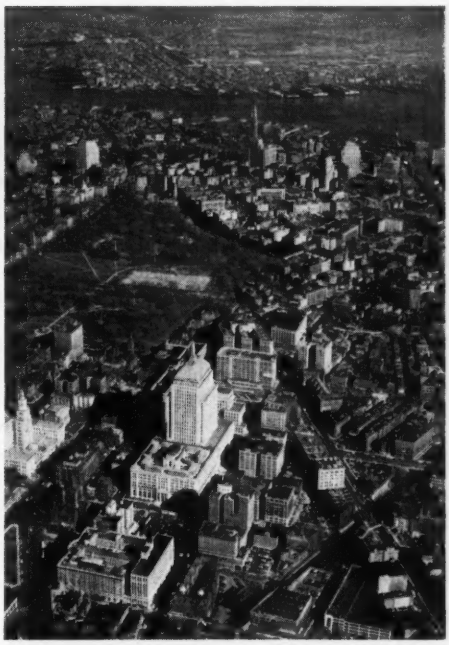
Hotels and Restaurants

Hotel accommodations, for the most part, are excellent, and the selection is wide. There are, to mention just a few, the Statler (Convention Headquarters), the Bellevue, the Parker House, and the Sheraton Plaza, but as we cautioned you in our January announcement, don't dilly-dally about reservations. Good accommodations will get you off to a running start; poor ones will leave you prancing in circles at the starting gate.

The mere mention of Boston conjures up visions of tasty repasts. 'Tis indeed "The home of the bean and the cod." But don't fret if your preference is for other fare. Baked beans and brown



KING'S CHAPEL—Founded 1686. First Episcopal church in New England. Here British officers worshipped during siege.



BOSTON, HUB OF THE UNIVERSE, as seen from the air. The Nation's oldest major city.

bread, cod and chowder are virtually staples "Down East," but they're by no means Boston's only vittles. Its menus reflect cuisine satisfying to the most jaded of palates.

It's a ticklish proposition, recommending restaurants, and we approach the subject fully conscious that our necks are sticking way out. However, the following are so generally acclaimed as to make the risk almost negligible. All are listed, of course, in the local telephone directory:

The Statler is a *must* in every gourmet's book. Another famous one is Locke-Ober's. Its French and American dishes are superb.

Noted for its Boston scrod, codfish tongues and rhubarb ice cream is the Parker House.

Big, noisy and informal is Jake Wirth's, famous for its pigs' knuckles, sauerkraut, wursts, and dark beer.

If you like shellfish, the Union Oyster House is virtually unsurpassed.

For Italian food, there are Malatesta's, Stella's, Boraschi's Grotto, and the Amalfi.

Should your mouth water for something oriental, there are Ruby Foo's and the Cathay House, and in a near-Eastern vein, the Olympia, famous for its shish kabob.

For smörgasbörd there are the Ola and the Norseman. If it's lox you want, gefilte fish, or almost anything else along those lines, don't overlook the Kosher Zion Restaurant. And for Spanish food, don't forget the Casa Latina.

There are, of course, scores of other fine places, but these are regarded as tops.

And that, in a cachet, is the Boston story. Sig:—Take as directed.

FANEUIL HALL with Custom House Tower in background. World-famous "Cradle of Liberty." Rebuilt in 1763.

by P. H. Costello*

Trends in Pharmaceutical Education

as revealed in a report to the National Drug Trade Conference showing improved facilities, faculties and curricula in pharmacy colleges and trends toward combined pre-professional and professional study.

THE GENERAL improvement and advancement in all phases of academic programs and procedures is indicative of what has transpired as well as the trend in pharmaceutical education.

At the present time there are 73 accredited colleges of pharmacy in the United States, 1 in Puerto Rico. Of these, 64 are now designated as Class A, 5 as Class B, 4 as Class C, and 1 as Class Y-4 colleges. If there had been a listing which revealed the Class designation that each of these colleges merited when first examined for accreditation and classification it would have been revealed that there were not more than 31 Class A colleges at that time, or five years ago.

Improved Facilities

The physical improvements are most obvious. New buildings have been or are being provided for ten colleges. A similar number of colleges are now housed in new wings or parts of new buildings shared with other disciplines and 9 colleges have been provided with recently altered or remodeled buildings.

Many of these colleges have acquired additional new laboratories, also new and special equipment to facilitate teaching and research. Twenty million dollars is believed to be a conservative estimate of the cost of the physical improvements that have been noted.

Teaching Staffs

At every institution the teaching staff has increased in number and been upgraded. There has also been a slow but steady improvement in the educational background of staff members. As far as numbers are concerned, the field of pharmaceutical chemistry appears to be in the best position, pharmacology appears to have fared pretty well but there still is a need for well-trained persons to teach pharmacology, pharmacognosy, pharmacy, and pharmacy administration, especially the latter.

There has been a marked improvement in the policies and practices governing the admission and promotion of students and the general conditions of faculty services. There is evidence that increased use is being made of libraries. Nine colleges developed in-service programs, seminars and the like for the first time last year, bringing the number that now have such programs to 39. Despite these many improvements there are still many colleges in which further improvements are urgently needed.

Curriculum

A great deal of attention is being given to the curriculum by practically every college of pharmacy and the curricula are greatly improved by the changes made. In most cases the changes were made by the staff as a whole, after careful study of the Blauch-Webster report on "Pharmaceutical Curriculum" and proceedings of the various teachers' seminars and discussion among themselves. Staff members have compared individual course syllabi to eliminate, or at least minimize duplication. More vital and modern material has been introduced. Considerable improvement in course sequence is evident. In general it can be said that the improved staff situation is reflected in the higher level at which courses are offered.

It is believed that there is ample room for further improvement of the curricula and also it seems certain that hereby pharmacy faces a challenge. The curriculum must include instruction in each of three natural divisions: (1) non-scientific courses in general education, (2) mathematics and the basic physical and biological sciences, and (3) courses in the five areas of pro-

* Secretary, American Council on Pharmaceutical Education, Chicago, Ill.

fessional instruction, which areas are pharmaceutical chemistry, pharmacognosy, pharmacology, pharmacy, and pharmacy administration.

A great many staff members, some college and university administrators believe it is not feasible to design a four-year curriculum that will show a logical balance among the three natural divisions and among the five areas of professional instruction. Pharmacy Administration may be cited as an area of professional instruction that has, in the opinion of the profession, been neglected.

Extension of Educational Program

As mentioned in previous reports presented by Dr. Hugo H. Schaefer, there has been a distinct trend toward making a five-year curriculum or program optional or mandatory. The four-year curriculum will have been supplanted by a five-year curriculum at seven colleges. A six-year program has supplanted the four-year program at the University of Southern California; a six-year course is offered on an optional basis at the University of California. The five-year program has supplanted the four-year at the University of Puerto Rico and the University of the Philippines, making a total of ten institutions where completion of programs of five years or more are made mandatory for graduation.

In eight institutions, five-year programs are offered on an optional basis along with four-year programs. At another institution (University of Florida) the curriculum requires enrollment for slightly more than four academic years to complete.

A proposal to make completion of a five-year program mandatory in order to graduate from a college of pharmacy was approved by a majority of the colleges of pharmacy represented at the 1951 meeting of the American Association of Colleges of Pharmacy. At the 1953 meeting, action was taken to vote on a similar proposal in 1954 whereby persons would be required to complete a five-year program in order to be graduated after April 1, 1965. Also, at its 1953 convention the N.A.B.P. recorded itself as favoring the adoption of the five-year curriculum or program as the minimum requirement for graduation, said requirement to be effective for students who enroll in colleges of pharmacy on and after July 1, 1957. The A.PH.A. and A.C.A. have also recommended, by resolution, that the five-year program be adopted.

The majority of colleges of pharmacy do not require the completion of any pre-pharmacy courses for admission and enroll students who are graduated from high school. Twelve colleges, having four-year programs, do not enroll students as freshmen but only enroll students who have completed one year of pre-pharmacy and make it possible for them to graduate after being enrolled for three years in the college of pharmacy.

Of the colleges that make completion of the five-year program mandatory; three operate on the basis of two years in pre-pharmacy and three years in pharmacy; three on the basis of one year in pre-pharmacy and four years in pharmacy; and at three institutions students are enrolled in pharmacy all five years. The only six-year course is based on two years in pre-pharmacy and four years in pharmacy.

Pharmacy Manpower

At all times during the last five years there has been a shortage of pharmacists despite the fact that the number graduated each year was in excess of the number calculated, according to the "Findings of the Pharmaceutical Survey," to be the normal number required annually to replace pharmacists engaged in practice who died or retired from practice. However, the shortage at this time appears to be less acute than at any time since the close of World War II, and the January 1, 1953, N.A.B.P. Census of Pharmacists lists a greater number of pharmacists engaged in practice than any similar census in the preceding five years.

Total undergraduate enrollment, which was at the high peak five years ago, has decreased gradually but noticeably each year since that time. In discussing the general educational qualifications of undergraduate students enrolled in colleges of pharmacy with deans and admission officers, it is surprising to learn that a great many of the pharmacy students have had one or more years of college education before being admitted to the school of pharmacy. It is not unusual to find pharmacy students who have a baccalaureate degree.

The number enrolled annually at the graduate level and the number that have completed graduate training have increased. It is quite unlikely that such would have been the case were it not for the American Foundation for Pharmaceutical Education. The benefit that pharmaceutical education has derived directly and indirectly from this Foundation is inestimable. The progress herein noted could not have been achieved if the Foundation had not provided funds for undergraduate scholarships, for graduate fellowships, for the American Council on Pharmaceutical Education to function as it has, and for other educational activities.

NEW PRESCRIPTION PRODUCTS

All items on which information has been received in the past thirty days are reported here. Manufacturers are urged to send details of their new products as early as possible, so that pharmacists through these pages will have full information at the same time, or even before, products are detailed to the physician. For inclusion in this free editorial department, send descriptive literature to the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, *2215 Constitution Avenue, N. W., Washington, D. C. Where possible, all descriptions should follow the style shown on these pages.*

Bardase Tablets

Description: Each sugar-coated tablet contains belladonna extract, 10 mg. (1/6 gr.); phenobarbital, 15 mg. (1/4 gr.); and Taka-diastase, 150 mg. (2 1/2 gr.).

Indications: An anticholinergic, starch-digestant sedative for smooth muscle or visceral spasm, particularly when gastrointestinal or genitourinary tracts are involved.

Administration: One or two tablets three times daily, as prescribed by physician.

Form Supplied: Bottles of 100 and 1,000 tablets.

Source: Parke, Davis & Co., Inc., Detroit, Mich.

Ilotycin Glucoheptonate I. V.

Description: Each vial contains sterile erythromycin glucoheptonate equivalent to 250 mg. of erythromycin, to which is added sterile distilled water for solution.

Indications: Same as for oral erythromycin, and for such serious infections that might require an almost immediate therapeutic effect.

Administration: Intravenous infusion—mix the water solution (10 cc.) of 250 mg. of the drug with 250–500 cc. of saline or 5% dextrose and give slowly (20–60 minutes). Continuous i.v. infusion—dissolve 1–2 Gm. of the drug in water and add to the quantity of vehicle to be given in twenty-four hours. Intravenous injection—dissolve the contents of 1 vial in water and inject slowly (at least five minutes). Children—3 to 4 mg./lb. of body weight every six hours by any of the three methods.

Form Supplied: Vials of sterile powder equivalent to 250 mg. of erythromycin.

Source: Eli Lilly & Co., Indianapolis, Ind.

Isopto-Carpine Ophthalmic Solutions

Description: Solutions containing 1% or 2% pilocarpine HCl in a buffered methylcellulose vehicle.

Indications: For treatment and control of glaucoma and for use when miosis is desired.

Administraiion: Apply to the eye by inverting and applying slight pressure to the plastic dropper container (Drop-tainer).

Form Supplied: 15-cc. Drop-tainer.

Source: Alcon Laboratories, Inc., Fort Worth, Texas.

Lutrexin Tablets

Description: Each tablet contains 1,000 units of Lutrexin, a water-soluble, protein-like, uterine relaxing factor obtained from the ovary.

Indications: For dysmenorrhea, threatened abortion, and other disorders associated with hypermotile uterine dysfunction.

Administration: Dysmenorrhea—2 to 4 tablets followed by 2 or 3 tablets every three or four hours if needed. Threatened abortion—1 to 3 tablets three times a day.

Form Supplied: Bottles of 25 tablets.

Source: Hynson, Westcott & Dunning, Inc., Baltimore, Md.

Neo-Cortef Ointment

Description: The ointment contains hydrocortisone acetate, 1% or 2.5%; neomycin sulfate, 0.5%; methylparaben, 0.02%; and butyl-*p*-hydroxybenzoate, 0.18%.

Indications: For treatment of skin inflammations and bacterial infections.

Administration: Locally as prescribed.

Form Supplied: Available in 5-Gm. and 20-Gm. tubes.

Source: The Upjohn Company, Kalamazoo, Mich.

Nitroglyn Tablets

Description: Each oral tablet contains: 1/25 grain (2.5 mg.) of nitroglycerin in a sustained action medium.

Indications: As a coronary vasodilator to prevent the vasoconstricting effects of physical or mental stress reaction.

Administration: One tablet in the morning and one at bedtime. The tablets are swallowed. *They are not for sublingual use.*

Form Supplied: Bottles of 50 tablets.

Source: Key Corp., Miami, Fla.

Parsidol Tablets

Description: Tablets containing 10 mg. or 50 mg. of Parsidol [N-(2-diethylaminopropyl)-phenothiazine HCl].

Indications: For the relief of symptoms of Parkinson's disease; exerting sedative, antispasmodic, and antihistaminic effects. Parsidol is contraindicated in the presence of glaucoma.

Administration: Initial oral dose is 10 mg. four times daily, with gradual increase to desired level.

Form Supplied: Bottles of 100 and 500 tablets.

Source: Warner-Chilcott Laboratories, New York, N. Y.

Penasoid Suspension

Description: An oral suspension containing in each 5 cc. 300,000 units of potassium penicillin-G in coconut oil. The butterscotch-flavored preparation does not require refrigeration.

Indications: For the treatment of most patients, particularly children, with diseases caused by penicillin-sensitive organisms.

Administration: One teaspoonful three or four times daily, preferably between meals.

Form Supplied: 60-cc. bottles.

Source: Parke, Davis & Company, Detroit, Mich.

Other New Products

(Chemicals, clinical trial drugs, diagnostic aids, and equipment for the retail and hospital pharmacy)

Aurasol–Rorer (Improved)

Aurasol–Rorer (Improved), containing procaine butyrate, 4%; magnesium sulfate, 20.4%; aromatics, 0.1%; glycerin, *q. s.*, has been announced by *William H. Rorer, Inc.*

Clistin Expectorant Syrup

A syrup containing in each 30 cc.: Clistin (paracarbinoxamine) maleate, 12 mg.; ammonium chloride, 0.8 Gm.; sodium citrate, 0.8 Gm.; potassium guaiacolsulfonate, 0.4 Gm.; chloroform, 0.06 cc.; and benzyl alcohol, 0.3 per cent, has recently been marketed by *McNeil Laboratories Inc.* It is recommended as an antitussive, and is available in 1-pint bottles.

Dramcillin-300 Suspension

Dramcillin-300 Suspension, containing in each 5 cc. of stable suspension 300,000 units of penicillin G potassium, is being supplied by *White Laboratories Inc.*, in 60-cc. bottles. Dramcillin-250 and -500 are also available.

Endolac

Endolac tablets containing ten vitamins and ten minerals have been made available by *Endo Products, Inc.*, as a food supplement during pregnancy. It is supplied in bottles of 100 and 1000 tablets.

Estrogen-Progesterone in Oil

George A. Breon & Co. has recently marketed estrogen (2.5 mg.) and progesterone (25 mg.) in an oil base, in 10-cc. vials. The product was previously offered in an aqueous suspension in the same size and concentration.

Mediatric Liquid—New Dosage Form

Specially formulated to meet certain specific requirements of the aging, Mediatric Liquid, a steroid nutritional compound for use in preventive geriatrics, has just been released by *Ayerst, McKenna & Harrison, Ltd.* Each 15 cc. or 3 teaspoonfuls provides: conjugated estrogens equine (Premarin), 0.25 mg.; methyltestosterone, 2.5 mg.; thiamine HCl (B_1), 5 mg.; vitamin B_{12} (crystalline), 1.5 mcg.; folic acid, 0.33 mg.; and *d*-desoxyephedrine HCl, 1 mg. Contains 15 per cent alcohol. It is available in bottles of 16 fluidounces and 1 gallon.

Multicebrin Jr.

The new dosage size of *Eli Lilly and Company*'s Multicebrin with the vitamin dosage adjusted in each Gelseal to meet the requirements of the child in the 5–12 age group, is marketed as Multicebrin Jr.

Neodrops—New Dosage Size

The water-miscible multiple vitamin drops, formerly available from *Walker Laboratories, Inc.* in 15-cc. containers are now available also in 30-cc. containers.

Neomycin Ointment

A new product of the *Norwich Pharmacal Company* contains neomycin sulfate, 5 mg. (equivalent to 3.5 mg. of neomycin) per Gm. of ointment. It is recommended for minor skin infections.

Correction

Dexalme L. A. Capsules is the correct name for the Meyer Chemical Company product listed as Dexaline L. A. Capsules in THIS JOURNAL, **15,** 74 (1954). Each capsule contains 15 mg. *d*-amphetamine sulfate in coated pellets which release the drug over a six- to ten-hour period. Available in bottles of 100 and 1,000.

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Compounding Aids

In the following pages we present Part III of a series of articles dealing with current developments in formulation and compounding techniques.

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AN IMPROVED Suntan Cream

by E. Roy Hammarlund*

A STUDY of N. F. Sun Cream (1) was undertaken to improve the ease of manufacture, improve its physical properties, augment its local anesthetic activity, and to improve its sunscreening ability. The first two objectives were prompted by the difficulty presented in obtaining a smooth consistency resulting from the lumping of insoluble ingredients, and the opinion of some authors (2, 3) that greasy preparations should not be used in the treatment of sunburn.

Experimental

The two compounds, phenyl salicylate and ethyl aminobenzoate, in N. F. Sun Cream both have sunscreening capacities. From spectrophotometric studies of 0.001 per cent solutions of phenyl salicylate and ethyl aminobenzoate in ethyl alcohol, Fig. 1, it was found that the sunscreening ability of phenyl salicylate was quite weak in the so-called "sunburning" region of the spectrum of approximate wave lengths 2900–3200 Å. Using the relative sunscreen index of Kumler (4) as a comparative basis, phenyl salicylate was found to have a value of 2.1 at 3080 Å., whereas ethyl aminobenzoate has a much higher value of 9.6. Also, phenyl salicylate undesirably absorbs more ultraviolet rays than does ethyl aminobenzoate in the so-called "tanning" region of the spectrum (wave lengths approximately 3200 Å. and greater). Therefore, the phenyl salicylate was dropped in the proposed formula and the concentration of ethyl aminobenzoate was increased from two to three per cent. This resulted in a more efficient sunscreening preparation due to the increased absorption of the sun's erythematic rays.

The photosensitivity or stability of sunscreens in the presence of ultraviolet light is an important property of any chemical screen. Christensen and Giese (5) found that ethyl aminobenzoate showed a great increase in sunscreening properties after a two-hour irradiation with a commerical G. E. sunlamp. Irradiation tests in this laboratory with the use of a more powerful ultraviolet light source, a Bricker mercury vapor lamp, showed that there was no loss in the sunscreening properties of a 0.1 per cent solution of ethyl aminobenzoate in propylene glycol after a twenty-minute irradiation period at 30 inches. This would be comparable to over three hours of direct midday summer sunlight. The solutions

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and propylene glycol blanks were tested for their ultraviolet absorption both before and after irradiation by means of a Beckman DU spectrophotometer.

The ingredients titanium dioxide and neocalamine which impart a physical screen or "umbrella effect" were thought to be desirable and therefore were left unchanged in the improved preparation. If these materials are not available as impalpable powders, it is recommended that they be passed through a No. 100 sieve before incorporation to assure a nongritty preparation.

Since it is desirable to make this preparation as water-miscible as possible, various polyethylene glycol compounds[1] were used as a replacement for white wax. Of these, Carbowax 1540[1] (N. N. R.) was found to give the most desirable consistency and it also aids with its humectant property.

The amounts of stearic acid and triethanolamine of the official preparation were increased to form a larger proportion of emulsion nucleus, the triethanolamine stearate. The increase in stearic acid also imparted to the preparation a *p*H closer to neutrality of 6.9–7.0 which, according to some authorities (6, 7) is more desirable than the approximately *p*H 8.5 of N. F. Sun Cream.

Whereas the official preparation utilizes yellow ferric oxide, this seemed to the author to impart a more yellow color than is desirable. It was found that brown ferric oxide in larger quantity than the yellow produced a more natural flesh-colored product. Of the various shades of brown ferric oxide commercially available, the darkest product obtainable was used.

An objection to the strong odor of coumarin, which was reported by many users of the official product, was rectified by reducing by one-half the amount in the suggested formulation. A more desirable coumarin fragrance results. Although coumarin has some sunscreening properties, the amount used in either the official or suggested formulation is too insignificant to afford any protection.

The glycerin was felt to be a desirable ingredient and the amount used was left unchanged.

A noticeable omission in the N. F. Sun Cream formula (1) is that of an effective preservative agent. Whereas the 5 per cent phenyl salicylate gives some protection and the ethyl aminobenzoate is mildly antiseptic, it is suggested that a more marked preservative agent be used. A concentration of 0.2 per cent methylparaben gave more desirable protection by its marked inhibition of bacterial growth. Agar plate tests with *Micrococcus pyogenes* var. *aureus* and *E. coli* by a method described by McLachlan (8) were used in testing the effectiveness of this compound. It was also found that the improved sun cream did not support the growth of three unidentified molds isolated in the laboratory and inoculated on the surface of the preparation.

The complete formulation of the improved sun cream and the suggested method of manufacture is as follows:

Ethyl aminobenzoate	30.0
Stearic acid	63.0
Triethanolamine	8.0
Stearyl alcohol	45.0
Carbowax 1540	30.0
Titanium dioxide	10.0
Neocalamine	10.0
Brown ferric oxide	1.5
Methylparaben	2.0
Coumarin	0.5
Glycerin	100.0
Distilled water, a sufficient quantity, to make	1000.0

(Continued on next page)

[1] Polyethylene glycol compounds were donated by Carbide and Carbon Chemicals Company, New York, N. Y.

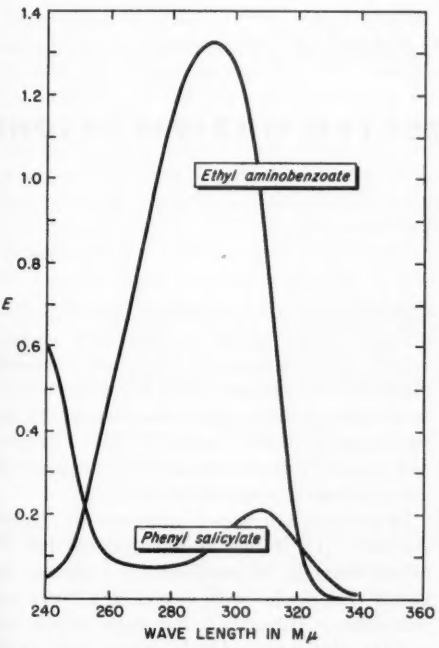

Fig. 1.—Ultraviolet absorption of 0.001% solutions of ethyl aminobenzoate and phenyl salicylate in ethyl alcohol.

Warm the triethanolamine and the stearic acid together on a water bath for ten minutes, add the Carbowax 1540 and the stearyl alcohol and continue heating until completely melted. Dissolve the ethyl aminobenzoate and the coumarin in this mixture. Add the finely powdered titanium dioxide, neocalamine, and brown ferric oxide and mix well with continued heating. Dissolve the methylparaben in the water and glycerin mixture which has previously been heated to about 80°. Slowly add this hot aqueous solution to the melted ingredients with constant stirring. Discontinue heating but continue the stirring until the emulsion formed has an ointment-like consistency.

There is no separation of any of the ingredients during the manufacturing of this sun cream. In fact, an electric stirrer is not necessary for mixing unless one is preparing a large amount. The author used a glass stirring rod and an electric mixer for small amounts with equally satisfactory results both in ease of mixing and in the consistency of the resulting ointment. The final preparation contains exactly 30 per cent chemical ingredients and 70 per cent water. The same method of packaging and storage is recommended as for the official product.

It is the opinion of the author, and also of many who have used the improved suntan cream under actual midsummer suntanning conditions, that the product is superior in every respect to the official cream.

Summary

The formulation of N. F. Sun Cream has been revised to form an improved cream. The improved cream, in addition to being easier to manufacture, has greater sunscreening ability; better local anesthetic properties; better consistency; more desirable color, odor, and *p*H; and has greater stability.

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Coal Tar Solution

SUGGESTED MODIFICATIONS

by Mitchel J. Stoklosa*
Leslie M. Ohmart*

IN THE PREPARATION of coal tar solution, the National Formulary directs that the coal tar and the quillaja be macerated with alcohol for a period of seven days. Presumably, the quillaja serves two purposes: first, it aids in the solution of the coal tar by dispersing it so that a greater surface area is exposed to the solvent; and secondly, it supplies the saponins which aid the dispersion of the alcohol-soluble constituents of the coal tar when the solution is diluted with water or with essentially aqueous liquids. If the quillaja properly serves its second function, the dispersion should be a permanent one. However, dilution of the official product with aqueous vehicles in concentrations which are commonly prescribed by dermatologists invariably results in an incompatibility that is manifested by a precipitation of coarse, brownish black particles and by a deposition of extractive material on the inner surfaces of prescription containers.

In previous attempts to overcome this incompatibility (1), it has been suggested that the official formula be modified by replacing the 95 per cent alcohol with alcohol of a lower concentration. Although it has been shown that coal tar solutions made with lower concentrations of alcohol possess a relatively high degree of compatibility with aqueous liquids, the amount of

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extractive in these solutions appears to be considerably lower than that contained in the official product.

Since there was some indication of the value of certain sorbitan derivatives as dispersing agents for coal tar in extemporaneous dermatological preparations, it was felt that the use of these agents in the manufacture of coal tar solution should be investigated. This study was undertaken, therefore, in order to determine if certain sorbitan derivatives would be useful, by virtue of their ability to act as solubilizers and dispersing agents, in the preparation of a coal tar solution containing an amount of extractive comparable to that found in the official solution and having, at the same time, a higher degree of compatibility with aqueous liquids than that manifested by the official product.

Experimental

The sorbitan derivatives chosen for the investigation were the polyoxyethylene derivatives since they, as a class, are soluble in alcohol and in water. In the preliminary studies polyoxyethylene sorbitan monolaurate (Tween 20)[1] and polyoxyethylene sorbitan monooleate (Tween 80)[1] were used as replacements for the quillaja in the official formula.

Two series of coal tar solution, each series consisting of five samples, were prepared from a market sample of coal tar, U. S. P., according to the National Formulary directions, but omitting the quillaja. In the first series Tween 20 was used in concentrations of 1, 2, 5, 10, and 20 per cent (w/v) in the maceration of the coal tar, and in the second series Tween 80 was used in the same amounts. A sample of the official solution was prepared as a standard for comparison. The samples were evaluated for color intensity by two observers and were subjected to compatibility tests by diluting a portion of each solution with 9 volumes of water, and again by diluting another portion of each solution with 15 volumes of a dermatologic lotion which contained menthol, glycerin, witch hazel, and boric acid solution.

In the opinion of the observers all of the samples except those containing 1 per cent of Tween 20 and 1 per cent of Tween 80 had a color intensity, as observed by visual means only, equal to or greater than the official product. Although most of the samples showed a remarkably high degree of compatibility when diluted with water, it was the opinion of the investigators that the solutions which were made with 2 and 5 per cent of Tween 80 gave the most satisfactory dispersions in the dermatologic lotion. The evaluation of these dispersions was made on the basis of the relative permanency of the suspension, the degree of fineness of the dispersed material, the absence of coarse, brownish black particles in the dilution, and, finally, the absence of a coating of extractive material on the inner surfaces of the bottles.

On the basis of these preliminary studies, the use of Tween 80 in concentrations of 2 and 5 per cent was further investigated. Accordingly, six samples of coal tar solution were prepared. The formulas used in the preparation of these samples are given in Table I.

The samples were prepared according to the National Formulary directions; the ingredients were mixed and allowed to stand for seven days with frequent agitation. At the end of the maceration period, they were filtered and their volumes were adjusted with the solvent.

Sample 2 was included in the study as representing a coal tar solution made by the official method but with a lower concentration of alcohol. Since it had been shown in a previous investigation (1) that a coal tar solution so prepared exhibited a high degree of compatibility with aqueous liquids, it was used in the study for purposes of comparison. Earlier, it was stated that the primary function of the quillaja in the official formula was to disperse the coal tar in the process of maceration and thus expose a greater surface to the solvent. Since it was felt that the deletion of the quillaja might cause some difficulty in achieving a proper dispersion of the

[1] Atlas Powder Company, Wilmington, Del.

TABLE I.—FORMULAS USED

Sample	Coal Tar, %	Quillaja, %	Tween 80, %	Washed Sand, Gm. per 100 cc.	Strength of Alcohol Used, %
1	20	10	..	..	95
2	20	10	..	..	70
3	20	..	2	..	95
4	20	..	2	50	95
5	20	..	5	..	95
6	20	..	5	50	95

coal tar, washed sand was included as a dispersing agent in samples 4 and 6. The samples were evaluated in the manner described below.

As in the preliminary studies, the color intensity of each sample was compared by visual observation with that of the official solution (sample 1). Sample 2 was lighter in color while samples 3, 4, 5 and 6 were at least as dark as the standard. This relative evaluation would seem to indicate that samples 3, 4, 5 and 6 contained at least as much extractive as was contained in the standard. Although it was suggested that a measure of the transmittancies of the samples or dilutions of them as determined with a photelometer might offer a means of determining the concentrations of the coal tar solutions (in terms of extractive), it was found that such a quantitative evaluation was not possible because some of the samples and their dilutions were not perfectly clear.

In order to determine the amount of extractive in the coal tar solutions, 10 cc. of each sample was placed in a tared evaporating dish and evaporated at 100° for five hours. Since Tween 80 is nonvolatile and heat-stable, a correction in the weights of the residues obtained from samples 3, 4, 5, and 6 had to be made. This correction was based on the weights of the residues that were obtained by evaporating, under similar conditions, 10-cc portions of control samples that were prepared in the same manner as the coal tar solutions, but using only Tween 80 and alcohol as the ingredients. The weights of the residues and the weight-to-volume percentages are shown in Table II.

TABLE II.—WEIGHT AND EXTRACTIVE PERCENTAGES OF RESIDUES

Sample	Weight of Extractive	Extractive, % (W/V)
1	0.2974	2.97
2	0.2435	2.44
3	0.3478	3.48
4	0.3470	3.47
5	0.3720	3.72
6	0.3987	3.99

It will be observed from these data that the samples in which Tween 80 was used contained considerably more extractive than samples 1 and 2 which were prepared by the official method and in which 95 per cent and 70 per cent alcohols were used as solvents. It should be noted that sample 4 in which washed sand was used as a dispersing agent contained no more extractive than its counterpart (sample 3), but that sample 6 in which washed sand was also used showed a greater amount of extractive than its counterpart (sample 5). In the opinion of the investigators it is desirable to use washed sand in the process of maceration since it was found that less difficulty is experienced during the extraction.

In an attempt to evaluate the compatibility of the coal tar solutions with aqueous liquids, each sample was used as an ingredient in the compounding of the following prescriptions.

℞ No. 1

Coal tar solution	10.0
Distilled water *q. s.*	120.0

Sig.: Apply as directed.

℞ No. 2

Coal tar solution	7.5
Menthol	0.1
Glycerin	5.0
Witch hazel	25.0
Boric acid solution *q. s.*	120.0

Sig.: Apply to affected areas.

The results of these tests, based on an observation period of fourteen days, are shown in Table III.

TABLE III.—TEST RESULTS

	Sample					
	1	2	3	4	5	6
Prescription 1	NS	S	S	S	S	S
Prescription 2	NS	S	S	S	S	S

S—Satisfactory; disperses well, forms a permanent suspension and shows no apparent sedimentation or deposition on the inner surfaces of bottles.
NS—Unsatisfactory; shows precipitation of brownish black particles, deposition of extractive on sides of bottles, and shows some degree of sedimentation.

Although the primary objective of this investigation was to prepare a coal tar solution that would be more fully compatible with aqueous liquids, it was felt that such a solution should also possess a high degree of compatibility with dermatologic preparations like calamine and neocalamine lotions, and calamine liniment. Therefore, each sample was tested for compatibility by using it as an ingredient in the following prescriptions.

℞ No. 3

Coal tar solution	10%
Calamine lotion *q. s.*	120.0

Sig.: For external use.

℞ No. 4

Coal tar solution	10%
Neocalamine lotion *q. s.*	120.0

Sig.: Apply at night.

℞ No. 5

Coal tar solution	5%
Calamine liniment *q. s.*	120.0

Sig.: Shake and apply.

The results of these tests were not compiled in tabular form. When used as ingredients in prescriptions 4 and 5, all of the samples of coal tar solution were satisfactory. Their compatibility in prescription 3, however, was variable. The lotions prepared with the six samples showed varying degrees of sedimentation and separation into layers after standing for seven days. The lotions prepared with samples 5 and 6 were the most satisfactory ones while the lotion made with sample 1 was the least acceptable. This difference in the degree of compatibility is probably explained by the fact that coal tar solution, in certain concentrations, is incompatible with calamine lotion, U. S. P. XIV. The difficulty is attributed to a breakdown of the emulsifying agent in the lotion by certain constituents of the coal tar. It is probable that the presence of 5 per cent of Tween 80 in samples 5 and 6 offsets this breakdown to some extent, with the result that less sedimentation was apparent. It is interesting to note that when calamine lotion, U. S. P. XIII, was used in compounding prescription 3, all of the samples were pharmaceutically acceptable.

Conclusions

The results of this investigation indicate that a solution of coal tar made with 5 per cent of Tween 80 and 95 per cent alcohol and using washed sand as a dispersing agent contains a higher proportion of extractive material than the official product. Moreover, the compatibility studies show that a solution so prepared is more fully compatible with aqueous liquids and exhibits a high degree of compatibility when used in the dermatologic preparations in which it was tested. On the basis of these results, the following formulation is suggested for further investigation.

Coal tar	200
Tween 80	50
Washed sand	500
Alcohol, to make	1,000

Mix the sand and the coal tar, add the Tween 80 and 700 cc. of alcohol, and macerate the mixture during seven days in a closed vessel, with frequent agitation. Then filter, and wash the contents of the vessel and the filter with sufficient alcohol to make the product measure 1,000 cc.

Authors' Summary

An investigation was undertaken to determine the usefulness of certain sorbitan derivatives in the preparation of coal tar solution.

Coal tar solutions containing Tween 80 were prepared and evaluated.

A formulation that appears to have advantages over the official product is suggested for further study.

REFERENCE

(1) Ohmart, L. M., *N. F. Bulletin*, Vol. XV, Nos. 9–10 172(1947).

(Compounding Aids Continued on next page)

Toxicity of Aminophylline

Toxic reactions from "child-size" suppositories containing aminophylline 0.25 Gm., pentobarbital 0.05 Gm., and benzocaine 0.03 Gm., are reported in one case of a 3½-year-old boy treated for asthma and bronchitis, and in another case of a 2-year-old child. Two medical consultants and the physician who made the report agree that the dose of aminophylline in the suppositories might be considered high, and that an initial dose of one-half or two-thirds of a suppository (0.125-0.16 Gm. of aminophylline) would be safer.

["Queries and Minor Notes," *J. Am. Med. Assoc.*, **154**, 543(Feb. 6, 1954).]

Stability of Procaine Penicillin G Ointment

Ointments containing 1,000 to 10,000 units of procaine penicillin G per Gm. of ointment, in a base composed of peanut oil, beeswax, and petrolatum, lost about 3.8 per cent of potency after four years at 22–28° and about 10.9 per cent of potency when kept at 34–40° for only four months.

[Buckwalter, F. H., and Holleran, Ruth, *Antibiotics and Chemotherapy*, **3**, 1111 (1953).]

Novocaine has been reported as a simple cure for warts on the soles of the feet.

Fresh Fruit Syrups and Elixirs AS VEHICLES

by | Fred G. Drommond*
H. George DeKay†

Syrups and elixirs prepared with fresh fruit juices are evaluated for their taste-masking effectiveness and for their application to cough syrup formulation.

ALTHOUGH LIQUID MEDICATION is employed less frequently than in former years, the liquid vehicle still remains the only means of medicating certain types of patients or dispensing certain types of drugs. Fluids for this purpose must be palatable. Today a wide choice of natural and synthetic preparations are suitable for disguising most of the unpleasant medicinal tastes. Fruits have always played an important role in the flavoring of pharmaceuticals especially in the form of fruit syrups (1–9).

The present investigation was undertaken to study the value of fresh fruit syrups and elixirs as pharmaceutical vehicles and to determine their efficacy in the masking of various types of drug medications.

Experimental

Syrups and elixirs were prepared from the twenty-four different fresh fruits listed: wealthy apple; apricot; blueberry; sour cherry; sweet cherry; cranberry; red currant; dewberry; gooseberry; concord grape; malaga grape; ribier grape; Florida grapefruit; lemon; lime; nectarine; Elberta peach; Kieffer pear; pineapple; sweet red plum; navel orange; black raspberry; red raspberry; and strawberry.

Preparation of Fruit Juices.—The juice was extracted and processed according to the official method for the preparation of cherry and raspberry juice in the N. F. VIII. The juice was allowed to come in contact with only glass or stainless steel.

Preparation of Fruit Vehicles.—The formulation as given in the N. F. VIII for cherry and raspberry syrups was selected for the basic formula for all the fresh fruits in order to have uniformity.

A basic formulation for the preparation of elixirs from the fruit juices was also required. Kendall (10) had reported a suitable "Raspberry Elixir for Vitamin B" and this formula was used as the basis. A taste panel of graduate students selected the percentage of basic ingredients needed in the formula, and established the fact that the same percentage of fruit juice would not produce an optimum flavor with each fruit.

The basic formulation for the fruit elixirs was as follows:

Fruit Juice	Optimum Amount
Sucrose	150.0
Glycerin	100.0
Alcohol	150.0
Benzoic acid	0.5
Distilled water, *q. s.*	1,000.0

The optimum percentage of juice for each fruit elixir is presented in Table I in conjunction with other data.

Evaluation of Vehicles by Taste Panel Methods.—Several different taste-test methods have been proposed for the determination of the taste-disguising efficacy of vehicles (11–13) and each method has its merits. The method used in the present investigation is based primarily upon the new combination method of Boothe and Kaufman (13) with a few modifications. Ammonium chloride corresponding to 7.5 per cent was used as a salty drug, and quinine hydrochloride corresponding to 0.1 per cent as a bitter drug. Stock solutions were made by dissolving the above amounts of the drug in 25 cc. of distilled water and making up to 100 cc. with the fruit vehicle. Controls of distilled water; syrup U. S. P.; cacao syrup U. S. P.; glycyrrhiza syrup U. S. P.; and aromatic elixir U. S. P. were prepared in the same manner and with the same amounts of each drug.

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The syrups and corresponding elixirs were divided into groups of four each, according to the type of fruit. Sample vials containing 4 cc. of the prepared stock solution of the drug and vehicle were used as samples. A panel of 50 undergraduate pharmacy students was selected for subjects. The group was divided into two groups of 25 each, and one group tasted all the ammonium chloride samples, while the other group tasted the quinine hydrochloride. The same students were used in each group throughout the experiment.

Only one group of four vehicles was tested each day by each panel. Prior to the test each individual rinsed his mouth with distilled water and tasted the control samples containing the same amount of medicament as in the samples to be tested, rinsing the mouth between successive samples until all tests were completed. Directions to the panel stated that at least fifteen minutes should elapse between successive samples tested. The syrup and elixir controls were evaluated in the same way, the vehicle never being known to the subject during the test.

A questionnaire sheet was furnished each subject and the following information obtained: (*a*) the primary taste when the sample was first placed in the mouth—list of descriptive terms was used and the subject made a selection; (*b*) the after-taste when the mouth was rinsed with distilled water—again descriptive terms were to be selected; (*c*) designation of the degree of taste of the medicament in each vehicle, i.e., salty or bitter with the comparative term; and (*d*) designation of the rating of each vehicle for medicament tested in comparative terms, i. e., fair, good, etc.

The single taste reported by the greatest number of subjects was considered to be the predominate "primary taste." The specific taste sensation reported by the greatest number of the panel after rinsing the mouth was considered to be the "after-taste." The degree of saltiness or bitterness was expressed by means of a numerical index which was derived arbitrarily by assigning a certain numerical value to each of the degrees listed on the questionnaire as follows:

Degree	Value
Not (salty/or bitter)	4
Slightly (salty/or bitter)	3
Just (salty/or bitter)	2
Very (salty/or bitter)	1
Extremely (salty/or bitter)	0

The total number reported for each degree was multiplied by the numerical factor for that degree; the products were added together and then divided by the number of subjects in the panel; each subject reported a degree so there was always some value to be recorded. The quotient which is obtained is a numerical value which is called the "salty" or "bitter" index. This numerical index can be used to indicate the comparative degree of saltiness or bitterness in the vehicle in question by referring back to the arbitrary set of factors which remain constant. Thus the higher the salty or bitter index, the less the degree of saltiness or bitterness, and the better the masking powers of the vehicle.

The "vehicle" index is a numerical value which is derived in the same manner as the salty or bitter index by assigning certain values to each of the descriptive terms, and calculating the index as before. The values or factors assigned to each term follow:

Term	Value
Excellent	4
Good	3
Fair	2
Poor	1
Very poor	0

The higher the vehicle index the better the masking characteristics of the vehicle, and the more preferred that vehicle is for that particular medicament. The subject indicated his rating of the vehicle on the basis of the primary taste, the after-taste, and the degree of taste of the medicament, as well as the palatability of the sample to the individual. The vehicle index can be used to indicate the comparative value of the vehicle in descriptive terms by referring back to the arbitrary set of factors which always remain constant. The use of these index values to express a large number of descriptive terms in the data has advantages in its simplicity and ease of calculation.

Results of Evaluation Studies.—Table I tabulates the results of the taste tests for both the syrups and elixirs for their efficacy in disguising the taste of both ammonium chloride and quinine hydrochloride. As masking agents for ammonium chloride, all the fruit syrups were superior to simple syrup, but inferior to cacao or glycyrrhiza syrups. Red raspberrry was rated first, blueberry second, and several were equal for third choice. For quinine hydrochloride all the fruit syrups were superior to simple syrup, all were inferior to cacao syrup, but several were better than glycyrrhiza syrup. Blueberry was rated slightly better than red raspberry, and several were equal for third choice.

(Continued on next page)

The elixirs were less effective in masking ammonium chloride than the fruit syrups. All but three of the fruit elixirs surpassed aromatic elixir as masking agents for ammonium chloride. Red raspberry was rated the highest. For quinine hydrochloride nine of the elixirs were rated lower than aromatic elixir. Orange was given first choice.

Incompatibility Studies.—On the basis of the vehicle index twelve fruit syrups and their corresponding elixirs were selected for additional study. These included: apple, concord grape, sour cherry, red plum, strawberry, red raspberry, dewberry, blueberry, cranberry, gooseberry, red currant, and orange. Chemical substances were selected which would represent various types of compounds, such as neutral salts, acid salts, basic salts, iron salts, strong acids, organic compounds, and alkaloids. As far as possible one average therapeutic dose of the chemical was added per fluid dram. The chemical was dissolved in 10 cc. of water and sufficient of the vehicle added to make 30 cc.

In general the fruit syrups and elixirs were not compatible with strong basic salts such as ammonium carbonate or sodium bicarbonate; strong acids such as dilute HCl; alkaloids such as quinine; or phenobarbital sodium. Alkaline salts decreased the color of cherry, red plum, blueberry, cranberry, and red currant. Those darkened or precipitated included grape, apple, strawberry, raspberry, dewberry, gooseberry, and orange. Grape gave a white precipitate with soluble potassium salts.

Evaluation of Fruit Syrups as Vehicles for Medicated Cough Syrups.—A formulation was made for a medicated cough syrup in which ten of the fruit syrups were vehicles and their efficacy evaluated in the same manner as previously outlined. Several expectorant drugs were included in the formula which were more or less common to all types of cough preparations. Lesser (14) and Stambovsky (15) list and discuss a number of expectorants. The following ingredients were selected as medicaments: ammonium chloride, potassium guaiacolsulfonate, antimony potassium tartrate, chloroform, and menthol.

In addition to the active ingredients listed above, the effect of the addition of gums and mucilages to the cough syrup in the evaluation of the disguising efficacy and demulcent characteristics was attempted. This study was not intended

TABLE I.—SUMMARY OF RESULTS OF TASTE-TEST DETERMINATIONS: FRUIT SYRUPS AND ELIXIRS

		Syrups				Elixirs				
		Ammonium Chloride		Quinine HCl			Ammonium Chloride		Quinine HCl	
Group	Name of Fruit	Salty Index	Vehicle Index	Bitter Index	Vehicle Index	Juice, %	Salty Index	Vehicle Index	Bitter Index	Vehicle Index
CONTROL	Syrup U. S. P.	1.0	0.8	1.4	1.0	..	...	...	...	...
CONTROL	Cacao Syrup U. S. P.	3.4	3.5	3.9	3.6	..	...	...	...	...
CONTROL	Glycyrrhiza Syrup U. S. P.	3.5	3.4	2.4	2.0	..	...	...	...	...
CONTROL	Aromatic Elixir U. S. P.	...	...	...	...	..	1.3	1.2	1.8	1.4
A	Apricot	1.3	1.1	2.0	1.4	40	1.4	0.8	1.2	1.0
	Nectarine	1.3	1.1	1.8	1.4	40	1.8	1.4	1.3	1.1
	Peach	1.7	1.3	2.1	1.6	40	1.6	1.4	1.2	1.1
	Pear	1.6	1.5	1.8	1.4	40	1.5	1.3	1.1	1.0
B	Pineapple	1.8	1.5	1.9	1.2	40	1.4	1.0	1.5	1.3
	Concord grape	2.2	1.8	2.4	1.6	40	1.6	1.4	1.8	1.5
	Malaga grape	2.4	1.9	2.2	1.6	40	1.6	1.3	1.7	1.4
	Ribier grape	2.2	1.8	2.5	1.8	40	1.7	1.4	1.8	1.4
C	Apple	2.3	1.9	2.5	2.3	40	1.8	1.1	1.7	1.3
	Sour cherry	2.4	2.2	2.4	2.1	30	1.8	1.5	1.8	1.5
	Sweet cherry	2.4	2.2	2.5	2.2	30	2.0	1.6	1.7	1.5
	Red plum	2.4	2.0	2.6	2.4	40	1.7	1.4	1.5	1.4
D	Strawberry	2.5	2.2	2.5	2.4	40	2.2	1.7	1.9	1.7
	Red raspberry	2.7	2.6	2.7	2.5	30	2.1	1.9	2.0	1.8
	Black raspberry	1.7	1.2	1.9	1.8	20	1.9	1.6	1.6	1.4
	Dewberry	2.4	1.9	2.5	2.2	30	2.1	1.7	1.8	1.5
E	Blueberry	2.7	2.4	2.7	2.6	40	2.0	1.5	1.8	1.5
	Cranberry	2.2	2.1	2.4	2.4	30	1.7	1.4	1.4	1.2
	Gooseberry	2.6	2.2	2.3	2.4	30	2.1	1.6	2.0	1.7
	Red currant	2.3	2.0	2.2	2.1	30	2.0	1.7	1.9	1.7
F	Orange	2.1	2.2	2.4	2.3	30	2.0	1.4	2.1	1.9
	Grapefruit	2.1	1.9	2.1	1.6	20	1.8	1.4	1.9	1.6
	Lemon	1.5	1.4	1.9	1.5	15	2.0	1.6	1.7	1.3
	Lime	1.8	1.5	1.3	1.1	15	1.9	1.4	1.5	1.1

to evaluate the therapeutic values of gums, but to see if the addition of gums would have any appreciable effect on the taste disguising efficacy of the fruit syrups as cough vehicles. Also to determine if the demulcent characteristics could be evaluated by taste test methods in terms of a demulcent index which would be comparable with the other index values established.

A number of natural and artificial gums were selected for the study. Viscous mucilages were prepared in the usual manner with acacia, tragacanth, sodium alginate, Kraystay (Kraft's purified Irish moss), sodium carboxymethylcellulose (CMC-70-H), methylcellulose (4,000 c. p. s.), and pectin N. F. Trial samples were made with a fruit syrup and ranges from 10–40 per cent of the above mucilages. All the mucilages were compatible with the syrups with the exception of the methylcellulose which separated because it was rendered insoluble by the concentrated syrup. Therefore it was eliminated from the study. The desired viscosity and appearance for a good cough syrup were obtained by using approximately 40 per cent of the mucilage. This resulted in a dilution of the syrup with subsequent loss in flavor and making power. Therefore it was decided to incorporate the dry powdered gum directly into the syrup with a minimum of water. This was done by placing the powdered gum in a dry mortar, wetting with glycerin, and mixing thoroughly with the pestle. A small quantity of the syrup was then added with thorough mixing, followed by the addition of 3 cc. of water and trituration until a thick mucilage resulted. Finally sufficient syrup was added to make the required volume; the entire mass was stirred with a mechanical stirrer at low speed for approximately fifteen minutes.

Kraystay formed a mucilage with difficulty and did not present a good pharmaceutical appearance and therefore was eliminated. Acacia was selected instead of tragacanth because of the ease of incorporation. CMC was used as the artificial gum. Kelcosol was selected instead of sodium alginate. A good white N. F. grade of pectin could also be used satisfactorily. Studies indicated that the following percentages of gums were suitable: acacia, 5 per cent; pectin, 1.5 per cent; Kelcosol, 1 per cent; and CMC, 0.8 per cent.

The following medicated cough syrup was then formulated:

Ammonium chloride	1.73
Potassium guaiacolsulfonate	1.73
Antimony potassium tartrate	0.009
Chloroform	0.41
Menthol	0.017
Glycerin	3.00
Distilled water	3.00
Powdered gum, *q. s.*	
Fruit syrup, *q. s.*	100.00

Five medicated cough syrups were made from each of the ten syrups previously selected. One was medicated but did not contain added gum and was used as the control. The other four were prepared with the percentages of gums as indicated above. The group of five medicated cough syrups made from the same fruit was tasted by the panel during one taste period. The taste panel for this study was composed of 15 graduate and undergraduate students. The same panel evaluated all the cough syrups.

The "demulcent" index was also determined for this testing series. An additional section was added to the questionnaire requesting the rating in descriptive terms of the demulcent characteristics, and this in turn converted to an index comparable to the other index values established.

Results of Cough Syrup Evaluation Studies.—The results are tabulated in Table II. In general there is an indication that the salty index is higher for the medicated syrup without added gum which would indicate that the gums tend to increase the salty taste. There seems to be no general trend in regards to the vehicle index and the presence of gums. In a number of instances the vehicle index is higher with the gums present, and in others the index is lower. According to the results obtained from this study, it would appear that the gums do not always increase the masking efficacy of the fruit syrups.

The demulcent index seemed to be more consistently higher with the addition of the gums, but again there was no complete uniformity. In several instances the index was lower with pectin present. Pectin appeared to be less efficient for increasing the demulcent index than the other three gums studied. Acacia, Kelcosol, and CMC were rated approximately equal in their demulcent characteristics.

Summary and Conclusions

1. Twenty-four fresh fruit syrups and elixirs have been satisfactorily prepared and have shown reasonable stability under ordinary storage conditions.

2. The fruit vehicles have been evaluated by taste-test methods for their disguising efficacy for ammonium chloride and quinine hydrochloride.

(Continued on next page)

3. None of the fruit syrups was as effective as syrups of cacao and glycyrrhiza for masking ammonium chloride. Blueberry and red raspberry rated best among the fruit syrups studied.

4. None of the fruit syrups was as effective as cacao syrup for masking quinine hydrochloride, but several were superior to glycyrrhiza syrup. Again blueberry and red raspberry proved to be the best fruit syrups.

5. The fresh fruit elixirs were less efficient than the syrups as masking agents for the medicaments studied.

6. A "salty" or "bitter" index was developed for expressing the degree of taste of the medicament and a corresponding "vehicle" index was derived for expressing the masking qualities and general palatability of the vehicles.

7. The syrups and elixirs were studied for general incompatibilities and results indicated that the fruit vehicles are generally incompatible with strong acids, strong basic salts, alkaline salts, quinine, and phenobarbital sodium.

(Concluded on page 256)

TABLE II.—RESULTS OF TASTE-TEST DETERMINATIONS: FRUIT SYRUPS IN MEDICATED COUGH SYRUP

		Predominant Primary Taste		Positive After-Taste				
Fruit Syrup	Gum	Taste	% Reporting	% Reporting	Taste	Salty Index	Vehicle Index	Demulcent Index
Apple	None	Sweet	40	73	Cool	2.9	2.0	1.9
	Kelcosol[a] 1%	Sweet	60	67	Sweet	2.9	2.5	2.4
	CMC[b] 0.8%	Sweet	47	60	Cool	2.9	2.3	2.5
	Acacia 5%	Sweet	60	53	Cool	3.0	2.5	2.5
	Pectin 1.5%	Salty	67	53	Salty	2.5	2.4	2.5
Sour cherry	None	Sweet	53	60	Cool	2.9	2.6	2.3
	Kelcosol 1%	Salty	53	47	Salty	2.8	2.6	2.5
	CMC 0.8%	Salty	40	80	Salty	2.7	2.7	2.7
	Acacia 5%	Sweet	33	73	Salty	2.5	2.4	2.7
	Pectin 1.5%	Sweet	47	73	Salty	2.8	2.7	2.5
Red plum	None	Sweet	47	80	Cool	3.3	2.5	2.8
	Kelcosol 1%	Sweet	53	73	Cool	3.1	2.7	2.4
	CMC 0.8%	Sweet	60	53	Sweet	2.9	2.5	2.5
	Acacia 5%	Salty	40	67	Warm	2.6	2.1	2.3
	Pectin 1.5%	Sweet	47	53	Cool	2.7	2.3	2.5
Strawberry	None	Salty	53	67	Warm	3.3	2.9	2.5
	Kelcosol 1%	Salty	60	53	Salty	2.5	2.9	2.5
	CMC 0.8%	Sweet	53	60	Cool	3.0	3.2	3.3
	Acacia 5%	Sweet	47	93	Cool	2.3	2.3	2.7
	Pectin 1.5%	Salty	60	60	Salty	2.6	2.5	2.1
Red raspberry	None	Sweet	67	60	Cool	3.6	3.4	2.8
	Kelcosol 1%	Salty	47	87	Cool	2.7	2.5	2.5
	CMC 0.8%	Salty	47	73	Warm	2.7	2.7	2.9
	Acacia 5%	Sweet	33	67	Cool	2.3	2.3	2.5
	Pectin 1.5%	Salty	47	53	Cool	2.5	2.0	1.9
Blueberry	None	Sweet	60	60	Sweet	3.0	3.1	2.7
	Kelcosol 1%	Sweet	60	73	Sweet	2.9	3.0	3.1
	CMC 0.8%	Sweet	40	53	Sweet	3.0	3.0	2.7
	Acacia 5%	Sweet	53	73	Sweet	2.3	2.3	3.0
	Pectin 1.5%	Sweet	47	53	Sweet	3.0	3.0	2.5
Cranberry	None	Salty	53	47	Salty	2.7	2.5	1.9
	Kelcosol 1%	Salty	60	53	Salty	2.2	2.1	2.1
	CMC 0.8%	Salty	60	53	Salty	2.5	2.3	2.3
	Acacia 5%	Sweet	47	73	Cool	2.4	2.5	2.5
	Pectin 1.5%	Salty	67	53	Salty	2.0	1.8	1.8
Gooseberry	None	Sweet	47	67	Cool	3.3	2.8	2.5
	Kelcosol 1%	Sweet	53	73	Sweet	2.6	2.7	2.6
	CMC 0.8%	Sweet	60	87	Cool	2.8	2.5	2.8
	Acacia 5%	Sweet	47	67	Cool	2.4	2.3	2.6
	Pectin 1.5%	Sweet	60	73	Sweet	2.5	2.2	2.4
Red currant	None	Sweet	47	73	Cool	3.1	2.6	2.7
	Kelcosol 1%	Sweet	53	80	Cool	2.8	2.7	2.5
	CMC 0.8%	Sweet	47	67	Sweet	2.9	2.8	3.0
	Acacia 5%	Sweet	53	53	Warm	2.5	2.3	2.6
	Pectin 1.5%	Salty	47	60	Salty	2.5	2.8	2.5
Orange	None	Sweet	53	67	Cool	3.3	3.0	2.8
	Kelcosol 1%	Sweet	60	73	Cool	3.0	2.8	2.8
	CMC 0.8%	Sweet	67	60	Sweet	2.9	2.9	3.0
	Acacia 5%	Salty	47	73	Cool	2.5	2.5	2.5
	Pectin 1.5%	Salty	40	80	Sweet	2.6	2.6	2.5

[a] Kelcosol is the registered trade mark of Kelco Company for a high-viscosity sodium derivative of alginic acid.
[b] CMC is the registered trade mark of the Hercules Powder Company for cellulose gum or sodium carboxymethylcellulose.

by Edward S. Brady*

Drugs for Cancer

Intensive cancer research reveals the growing importance of drug therapy. Prof. Brady summarizes the present state of progress in this field.

AN IMPORTANT PART of the cancer research program is the development of new medicinal agents to retard or arrest the growth of cancerous tissues. While this problem would at first appear to be vulnerable to solution by the usual chemotherapeutic approaches, the fact remains that despite much painstaking research in this area, only a few drugs of moderate usefulness have been developed. The reason for this lack of success stems from the fact that in the chemotherapy of cancer one is not dealing with a parasite or bacterium foreign to the body, but with the host's own tissues, changed in pattern and rate of growth because of some subtle metabolic derangement. How carefully balanced must be the magic bullet, and how cautious the aim of the chemotherapist, to destroy this rebel tissue without harming the normal cells!

Since abnormal mitosis is a characteristic of cancer, drugs which inhibit cell division, termed antimitotics, may be the most useful. This antimitotic effect is not limited to any one type of compound, nor does it act solely upon cancerous cells. Thus new substances can sometimes be evaluated in the laboratory by observation of their inhibitory effect upon the growth of other cells, such as the yeasts. Antimitotics may become most useful in the types of cancer in which the growth of abnormal cells is most rapid, and they are the anticancer compounds most frequently employed in neoplastic diseases of the blood and lymphatic systems. While antimitotic action is characteristic of a large number of compounds, we shall consider in this discussion only those substances which have had clinical trial or which show exceptional promise on the basis of preliminary investigation.

The Nitrogen Mustards

The observation that mustard gas, bis(β-chloroethyl)sulfide, $(ClCH_2CH_2)_2S$, blocked the carcinogenic action of dibenzanthracene spurred a search for similar compounds with lower systemic toxicity, and resulted in the preparation of a group of substances termed the nitrogen mustards. The most useful members of this group were shown to be methyl bis-(β-chloroethyl)amine, $CH_3N(CH_2CH_2Cl)_2$, (Mustargen), which will be official in the N. F. X, as mechlorethamine hydrochloride, and tris-(β-chloroethyl)amine, $N(CH_2CH_2Cl)_3$. Mechlorethamine hydrochloride is used in doses of 0.1 mg./Kg. body weight, in courses of 0.4 to 0.6 mg./Kg. body weight over four to twelve days. It is best given intravenously in a concentration of 1.0 mg./cc. with 250 cc. of dextrose or saline solution. The nitrogen mustards are most valuable in Hodgkin's disease, and less effective in lymphosarcomas and leukemias (1). The nitrogen mustards readily cyclize as free bases to the ethyleneiminium ion, which acts as an alkylating agent for suitable compounds. They combine with most cell constituents and inhibit many enzyme systems, including choline oxidase, cholinesterases, and pyruvic acid oxidase (2). Hemi-sulfur mustard (HSM) 2-chloro-2′-hydroxydiethylsulfide, and R-48, a β-naphthyl nitrogen mustard, have also received clinical trial (3).

Triethylene Melamine

Generally referred to as TEM, triethylene melamine is 2,4,6-triethyleneimino-*s*-triazine, $[(CH_2)_2N]_3(C{:}N \cdot C{:}N \cdot C{:}N)$. It is related to the nitrogen mustards, but represents an advance in therapy since it may be given by mouth. The suggested dose is 5 mg. with water before breakfast every other day for three doses. Depending upon the leukocyte count, therapy is resumed after a two- to three-week interval with a 5-mg. dose weekly (1). TEM is useful in Hodgkin's disease, lymphosarcoma, and lymphocytic leukemia, but refractoriness occurs ultimately as with the nitrogen mustards.

(Continued on next page)

* Professor of Pharmacy, University of Southern California, Los Angeles 7, Calif.

Drugs for Cancer

• • • • • • • • • • • • *from preceding page*

Urethane

Ethyl carbamate or urethane, $C_2H_5OCONH_2$, was among the earliest of the antimitotic drugs. It reduces spleen size and leukocyte count in leukemia. Initial dosage is about 6 Gm. per day, reduced to from 0.3 to 2 Gm. daily for maintenance. It should be given as enteric-coated tablets to reduce gastric irritation. Urethane is also effective in multiple myeloma, but continued use has caused hepatic necrosis in man (4).

Antimetabolites

A large number of competitive analogs of essential metabolites have been prepared and tested. Riboflavin analogs, isoriboflavin and galactoriboflavin, the pyridoxine analog, desoxypyridoxine, and a melamine antagonist and less important members of this group. A guanine antagonist, 8-azaguanine (Guanazole) has been used in doses of from 30 to 75 mg. per day intramuscularly. The adenine antagonist, 2,6-diaminopurine, is effective, and an adenine and hypoxanthine antagonist, 6-mercaptopurine, has been marketed as Purinethol, B-W. This latter compound is recommended for use in the treatment of acute leukemia and of chronic myelogenous leukemia. The dosage is dependent upon tolerance and leukocyte count, but the usual initial dose is 2.5 mg./Kg. body weight per day. Purinethol is available in 50-mg. tablets.

Azaserine

Isolated from a crude filtrate of a Streptomyces culture, azaserine, *o*-diazoacetyl-L-serine, $N_2CHCOOCH_2CH(NH_2)COOH$, was studied for anticarcinogenic action. In doses of 1 to 2 mg./Kg./day it prevented the growth of Crocker mouse sarcoma 180 in mice. No results of its clinical usefulness for man are available. Its therapeutic index is approximately 8, compared with TEM as 3 and nitrogen mustard as 1. It has been characterized chemically, and is a light yellow-green, water-soluble substance, stable in neutral solutions but decomposing at *p*H 2 with the evolution of nitrogen and loss of biological activity. Its action is probably due to competition with the amino acid, serine (5).

Folic Acid Antagonists

The inhibiting action of liver extract on experimental tumors in mice led to the use of folic acid derivatives in the treatment of malignancies in man. Two naturally occurring glutamic acid conjugates inhibit sarcomatous growth. They are Diopterin and Triopterin, and in man, while they both produce temporary remission of tumor pain, they do not more than briefly arrest malignant processes. The 4-amino-folic acid compounds are more active, and 4-amino-folic acid (Aminopterin) and 4-amino-N-methyl-folic acid (Amethopterin) are used in acute leukemia. 4-Aminopteroyl-aspartic acid (Amino-an-fol) is a similar compound with antileukemia properties. The effect of these drugs in acute leukemia is often dramatic, but the remissions produced are not protracted, and the toxic manifestations may be disastrous (6). Reduction of toxicity may be obtained by administration of the citrovorum factor, but this also reduces the effectiveness of the medication.

Other Substances

The list of substances which have received more than passing attention in cancer therapy is long. The usefulness of the estrogens and androgens in mammary and prostatic cancer is well established, ACTH and cortisone improve the patient's physical condition without altering the course of the disease in Hodgkin's disease. Biologic products of the adrenocorticosteroids-type briefly alter the course of neoplasms, and arsenicals, diamidines, alloxan, and colchicine find occasional therapeutic application. But much longer than this list of compounds of even the most limited values is the roster of substances which were found to be without merit. The "Negative Data from Experimental Cancer Chemotherapy Studies," last year, included some 2,300 drugs and chemicals (7).

It is fortunate, therefore, that the relatively few substances discussed here show some contribution to the comfort of the patient with disseminated malignant disease. It encourages the clinician and laboratory worker, for if these drugs slightly alter the course of the disease, there is a good possibility that a drug will eventually be found which will significantly alter the neoplastic processes. Meanwhile, techniques for the study and evaluation of new compounds have been improved, and the nature of malignancies is better understood. It is reasonable to believe that the coming years will bring, through a continuing program in cancer research, important drugs for the treatment of cancer.

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FROM THE SECRETARY'S DIARY FOR MARCH, 1954

1st March blew in like a lion and brought with it an avalanche of paper work, requests for professional relations background material, and the customary seasonal requests from high school counselors and students for vocational guidance material. Now and then efficiency experts suggest that form letters be used for certain types of correspondence, but inquiries which come to this office defy form treatment even if we were inclined to brush off our members with efficiency rather than information.

4th Today in New York discussing current problems with contemporaries in the editorial and organizational field and then attending the annual dinner of the Drug Chemical and Allied Trades Section of the New York Board of Trade. It is always a wonderful sight to behold the more than 2,400 representatives of all branches of pharmacy and the drug industry gathered in the great ballroom of the Waldorf-Astoria for this annual gathering.

8th Amid the routine of the usual busy Monday, come telephone calls from New York, Oxford, Miss., Buffalo, and other distant points and before we know it a May and June calendar which had some white space left becomes penciled with conferences and speech engagements.

9th At luncheon today with Col. Aabel and other high-ranking pharmacists in the office of the Surgeon-General of the Army and of the Medical Service Corps. The number of pharmacy officers is constantly on the increase, and meetings like this are indicative of the progress which pharmacy has made in securing its place in the Armed Services although there are many things still to be done before we can take full satisfaction in the place we have achieved.

15th Today meeting in New York with executives of the various organizations holding membership in the National Health Council for the discussion of personnel problems, office management, and general staff services. It is of some comfort to realize that other organizations functioning in the same field have similar problems and that apparently we are not far off the beam in their handling.

17th A pleasant break in the middle of the day to greet President Ivor Griffith of the Philadelphia College of Pharmacy and Science, who was in Washington to meet with graduates of the college in the interest of the campaign for funds now being conducted by that institution. With Dr. Griffith was Brua C. Goodhart, treasurer of the college, who confided that alumni in the district had disbursed handsomely before they dispersed.

19th At luncheon today with representatives of the Miami Beach Convention Bureau to learn of the detailed offerings of this popular resort in connection with our 1955 Convention to be held in late April or early May.

23rd A busy day in planning for the JOURNAL with special reference to the interests of the American Cancer Society which uses the month of April for its educational and fund-raising campaign. In the evening with the Torch Club, listening to a most interesting recital of government-sponsored research in many fields.

26th Yesterday and today attending the 1954 National Health Forum conducted by the National Health Council in New York. Chancellor Franklin D. Murphy, M.D., of the University of Kansas, gave a most inspiring address at the dinner last night asserting that the quest for better health springs from the grass roots all over the world and needs the well-planned attention of the health professions. Today the annual meeting of the delegates followed by the board of directors meeting. It appears that this council has taken a new lease on life and will continue to go places even though this may have to be done more conservatively.

30th This morning a meeting of the United States Committee on International Drug Standards at A.PH.A. headquarters with detailed discussion of the circulation of galley proof and procedure for handling comment from various sources and its transmission to W.H.O.

31st This afternoon a meeting of the steering committee of the Committee on Status of Pharmacists in Government Service with Major Arthur Einbeck presiding and Col. Aabel, Lt. Col. Roth, Pharmacist Directors George F. Archambault and Tom Foster on hand to give advice and information. The program for the committee's future efforts includes working for the rank of General for the chief of the Medical Service Corps.

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Hospital Pharmacy

Evlyn Scott Receives Award

Mrs. Evlyn Gray Scott, chief pharmacist at St. Luke's Hospital, Cleveland, Ohio, received the 1953 *H. A. K. Whitney Award* and gave the Whitney Lecture at a meeting of the Michigan Society of Hospital Pharmacists in Detroit on April 8. The Award, established in honor of the first chairman of the American Society of Hospital Pharmacists, is presented annually by the Michigan Society to an individual who has made outstanding contributions to the practice of hospital pharmacy. The subject of Mrs. Scott's lecture was "The Point-Rating Plan: An Opportunity." The Point-Rating Plan for evaluating pharmacy services was originally developed by the Catholic Hospital Association's Committee on Hospital Pharmacy Practice, and was presented to the American Society of Hospital Pharmacists at the 1952 Annual Meeting. It is currently being studied as a means of implementing further the *Minimum Standard for Pharmacies in Hospitals*.

Mrs. Scott's contributions have not been to hospital pharmacy alone but rather to the profession as a whole. She holds life membership in the A.PH.A., has long been active at annual conventions and in the A.PH.A.'s Subsection on Hospital Pharmacy prior to organization of the A.S.H.P. in 1942. Her participation in the work of numerous Society Committees, her contributions toward developing the *Minimum Standard for Pharmacies in Hospitals*, and the inauguration of an internship program at St. Luke's Hospital are well known to hospital pharmacists.

1954 Institutes Planned

The AMERICAN PHARMACEUTICAL ASSOCIATION and the American Society of Hospital Pharmacists cooperate each year in sponsoring two institutes on hospital pharmacy, one of which is in charge of the American Hospital Association and the other, the Catholic Hospital Association. Both institutes, or refresher courses, are designed to meet the needs of those practicing in this field.

A.H.A. Institute—Storrs

The Connecticut Society of Hospital Pharmacists will play host to the Institute the week of June 28 on the campus of the University of Connecticut, Storrs. Meetings, as well as housing and meals, will be on the University campus.

This year's program is designed to meet the needs of hospital pharmacists practicing in all types and sizes of institutions. Special attention will be given to the pharmacist's role as a department head; also, to bulk compounding and controls in the hospital pharmacy, and new trends in therapeutics.

Members of the Institute Planning Committee include Dr. Charles Letourneau, secretary of the A.H.A.'s Council on Professional Practice; Dr. Robert P. Fischelis, secretary of the A.PH.A.; Allen V. R. Beck, president of the A.S.H.P.; Dr. Don E. Francke, director of the A.PH.A.'s Division of Hospital Pharmacy; Gloria Niemeyer, assistant director of the Division; and Ruth Pully, secretary of the Connecticut Society. The local committee is headed by David Burack, president of the local organization.

C.H.A. Institute—Atlantic City

Mr. M. R. Kneifl, executive secretary of the Catholic Hospital Association, has announced plans for the Sixth Annual Meeting of this type sponsored by the C.H.A. Meeting in conjunction with the annual convention in Atlantic City, institute sessions are scheduled on May 17, 18, and 19. Sister Mary Berenice, S.S.M., St. Mary's Hospital, St. Louis, Mo., and treasurer-elect of the American Society of Hospital Pharmacists, heads the C.H.A.'s Committee on Hospital Pharmacy Practice which is in charge of the program. Other members of the committee are Sister M. Franciscana, O.S.F., St. Joseph Hospital, Memphis, Tenn.; Sister Marian, Sister of Charity of St. Elizabeth, St. Elizabeth's Hospital, Elizabeth, N. J.; Sister M. Ancilla, S.S.J., St. Joseph's Hospital, Hamilton, Ontario, Canada; and Sister Mary Rebecca, O.S.B., St. Benedict's Hospital, Ogden, Utah.

The program, designed especially to meet the needs of the Sister pharmacists, will cover radioisotopes, formularies, a review of new drugs; bulk compounding; purchasing and related functions; layout, equipment, and planning for the pharmacy; functions and responsibilities of the individual pharmacy committee member; and pricing policies.

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A.Ph.A. Women's Auxiliary.....

In Memoriam

"God's finger touched her and she slept." It is with deepest regret and sorrow that we record the passing from our midst of our beloved Honorary President, Anna W. Moulton, who peacefully fell asleep on February 13, 1954, at Ft. Myers, Fla., where funeral services were held Monday, February 15. To her devoted husband George, her children and grandchildren, the Women's Auxiliary of the American Pharmaceutical Association *extends heartfelt sympathy and love. No pen has ever more truly portrayed the characteristics of a human soul than the following lines which so perfectly depict the life of our dear member:*

"A soul sincere—
In action faithful and in honor clean,
Who broke no promise, served no selfish end—
Won the esteem of all and lost no friend."

Daphne C. Serles
Jannette Costello

Anna W. Moulton

1882 — 1954

Anna Wilhelmina Schellenberg was born in Muenchen-Gladbach, Germany, December 4, 1882. Her father passed away at an early date, and she and her mother migrated to America, settling in Manchester, N. H.

Even as a child she was so unselfish and devoted to her family and friends that she was given the nickname she carried through life, "Angie," for "angel."

At the age of sixteen she went to Boston, Mass., to attend art school, working in her spare time to pay for her room and one meal a day. But the strain of study and overwork was too much and she returned home, ill and worn. Then she decided to study nursing, and entered Lawrence General Hospital, Lawrence, Mass., from which she was graduated in 1910.

She was, successively, superintendent at Barr Hospital-Sanitarium, Lawrence, and superintendent of the Boston Homeopathic Hospital. From there she went to Elliot Hospital, Boston, a private establishment operated by Dr. Samuel Mixter. As his surgical nurse from 1912 to late 1914, "Angie" had many noted patients. Among them were David Graham Bell, George Arliss, the renowned British actor, and members of the McLean family of Washington, D. C.

"Angie" and George A. Moulton were married November 23, 1914. To them were born two sons, George, Jr. and Earl James.

In January, 1917, she and George bought a retail pharmacy in Peterborough, N. H., and it was there that she became a registered pharmacist.

In 1947, "Angie" and George moved to Fort Myers, Fla., and began to plan for their remaining years. All too quickly did they pass, but time, in its flight, did not pass her by unnoticed. So endeared had she become to the members of the Auxiliary that in August, 1953, at the A.Ph.A. convention in Salt Lake City, Utah, she was elected Honorary President for the year 1953–1954 of the Women's Auxiliary of the American Pharmaceutical Association.

EARLY AMERICAN PHARMACIES

BY GEORGE B. GRIFFENHAGEN*

XXI. THE PASTEUR-GALT APOTHECARY SHOP

Address: Colonial Williamsburg, Williamsburg, Va.
Hours Open: Daily: 10:00 a.m. to 5:00 p.m.
Admission: Free.
Floor Space: 800 square feet (separate building; two rooms).
Owner: Colonial Williamsburg.
History: Dr. William Pasteur founded this apothecary shop in 1760 on Duke of Gloucester Street about midway between the Raleigh Tavern and the Colonial Capitol in Williamsburg In 1775, Pasteur formed a partnership with Dr. John Minson Galt. This partnership was dissolved three years later, but the Galt family continued to operate the shop until 1819. The original building was destroyed prior to 1850, and the restoration was erected on the original site when John D. Rockefeller, Jr., restored Colonial Williamsburg. The Apothecary Shop was opened in 1950.
Description: With the exception of 12 glass jars, which are reproductions, the shop is furnished with shelfware, pharmaceutical equipment and furniture that are documented as original and typical of the period 1760–1800. An attendant

wearing authentic 18th century dress is on hand daily to explain the shop and its fixtures.
References: *Official Guide Book of Colonial Williamsburg*, 1951, p. 24.

J. Am. Pharm. Assoc., *Pract. Pharm. Ed.*, **11**, 680(1950).

Virginia Pharmacist, **34**, 585 (1950).

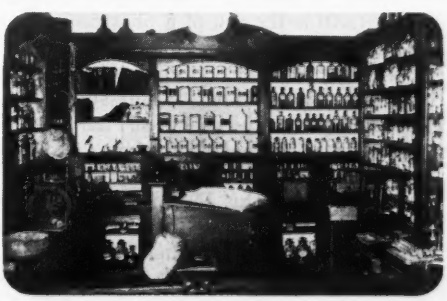
Midwestern Druggist, **26**, No. 2, 22 (1950).

Northwestern Druggist, **59**, 35, 50(1951).

American Druggist, **128**, 18(July 20, 1953).

XXII. LA PHARMACIE FRANCAISE

Address: 514 Chartres Street, New Orleans, La.
Hours Open: Monday through Friday; 9:00 a.m. to 5:00 p.m.
Admission: Free.
Floor Space: Four-story building; 1200 square feet (ground floor). Casual visitors view only ground floor; special groups may be taken through entire building.
Owner: City of New Orleans and the Loyola College of Pharmacy; managed by the College through the Historical Pharmacy Commission.
History: The building was erected on its present site in 1823 by Louis Joseph Dulfilho, who shares with Francois Grandchamps the honor of being America's first licensed pharmacist. Dulfilho sold his shop in 1855 and from then on the building changed hands many times and was used for many types of business until it was finally deserted in a state of deterioration. The Mayor of New Orleans purchased the building in 1937 and donated it to the city to be used as a museum. The restoration was opened for exhibition to the public in 1950.
Description: The ground floor exhibits a pharmacy of the period around 1880. The second floor



contains a pre-Civil War apothecary shop; the third floor contains antique furniture and display cases of pharmaceutical specimens.
References: "The Editor Visits La Pharmacie Francaise," reprint distributed by the museum, n.d.

Drug Topics **94**, No. 24, 1(1950).

Am. J. Pharm. Educ., **15**, 126(1951).

* Associate Curator, Division of Medicine and Public Health, Smithsonian Institution, Washington, D. C., and Consultant to the A.Ph.A. Museum. The 21st and 22nd of a series of monographs describing apothecary shop restorations on exhibition in the United States.

Straight from Headquarters

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With the number of prescription specialties continually increasing, we consider it essential to call the attention of our members to all helpful reference publications which may enable them to improve their services to the medical profession and themselves.

A Pharmacist College President

FROM the Secretary of the Virginia Pharmaceutical Association comes the pleasing news that Dr. R. Blackwell Smith, Jr. now dean of the School of Pharmacy of the Medical College of Virginia, has been named by the Board of Visitors of that institution to succeed Dr. William T. Sanger as president of the College on July 1, 1956. In the meantime, Dr. Smith will assume the newly created office of assistant president on July 1, 1954.

Dr. Sanger is known as one of the leading educators in the United States and one who has contributed much to an appreciation of the part played by the professions in the social structure of our nation. He will reach the retirement age in 1956.

It is a real tribute to Dr. Smith, and reflects considerable glory on the profession of pharmacy, to know that one who grew up in the profession and has won his spurs as a pharmaceutical educator should be named to succeed so brilliant a man as Dr. Sanger.

Dr. Smith is the son of a pharmacist and spent much of his early life in the pharmacy of his father.

Dean Smith is a native of Petersburg, Va., and a graduate of the School of Pharmacy of the Medical College of Virginia. He did graduate work at the University of Florida, where he received his M.S. in 1938, and at the University of Chicago, receiving his Ph.D. there in 1941. His field of specialization is pharmacology and he was for a number of years a pharmacologist in the U. S. Food and Drug Administration. He joined the faculty of the Medical College of Virginia as assistant dean of the School of Pharmacy under the late dean, W. S. Rudd, and succeeded him as dean.

We extend congratulations to Dean Smith and we believe he will demonstrate that pharmacy, which has been found to be good basic training for other administrative positions in the field of medical care, will also give to this college presidency a man of stature and ability comparable to that of other leading college presidents.

Pharmacy Student Enrollment

IN A report on enrollment in schools and colleges of pharmacy for the first semester, term, or quarter of 1953–1954, released by Dean Louis C. Zopf, chairman of the Executive Committee of the American Association of Colleges of Pharmacy, it is noted that there is a decrease in the enrollment of pharmacy students in colleges of pharmacy for 1953–1954 of 5.95 per cent, as compared with 1952–1953.

There is also a decline of 4.3 per cent in the total graduate student enrollment in schools of pharmacy.

There is an increase in the percentage of women students, the percentage for the period covered by the report being 10.2 per cent as compared with 9.69 per cent for 1952–1953.

In the University of the Philippines College of Pharmacy the enrollment consists of 271 women and only four men. In the University of Puerto Rico College of Pharmacy there are 82 women as compared with an enrollment of 76 men.

The total student enrollment in colleges of pharmacy for the first term of 1953–1954 is 15,799, as compared with 16,639 last year. The total graduate student enrollment is 570 as compared with 596 last year.

Rho Chi Directory

Dr. Lloyd M. Parks, secretary-treasurer of Rho Chi Honorary Pharmaceutical Society, announces the publication of a new Directory of Membership. This Directory consolidates all previously published directories and the annual supplements and includes the more than 6800 members on record, June, 1953.

Rho Chi now has 44 active chapters located at the leading colleges of pharmacy.

It is planned to publish annual supplements to the Directory giving the list of new members each year. Approximately 500 new members are added to the Society annually.

Individuals, institutions, and libraries may purchase the new directory, including future annual supplements from the office of the secretary-treasurer, University of Wisconsin School of Pharmacy, Madison, Wisconson, at five dollars per copy.

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STUDENT BRANCHES

The newly formed **South Dakota State College Branch** has elected the following officers: George E. Moses, president; Sheldon Murphy, vice-president; Betty Olson, secretary; Marvin J. Erickson, treasurer.

The **University of Wisconsin Branch** met February 16. Approximately 75 members were in attendance and President Bob Schwartz presided. The following were elected to office: Charles Gorske, president; Ronald Hoffman, vice-president; Mary Kay Staidl, secretary; Carla Schaefer, treasurer.

Approximately 100 attended the March 8 meeting of the **Fordham University Branch.** Branch President James N. Robertson presided, and the guest speaker was William Carlock of Eli Lilly and Company whose subject was "In These Hands." A film was also shown depicting the manufacture of pharmaceuticals at the Lilly plant.

The following have been elected to office by the **University of Kentucky Branch:** Don Barker, president; Gilbert Hopkins, vice-president; Charles G. Mills, Jr., secretary-treasurer.

On January 1, the **Ohio Northern University Branch** met to hear Congressman John A. McGuire speak on "The Story Within the Story," a discussion on his fair trade bill known as the McGuire Bill. Meeting with the Branch was the Northwestern Ohio Pharmaceutical Association.

The **University of Mississippi Branch** met on February 22. President W. A. Moore, Jr., presided and Dr. E. L. Hammond, dean of the School of Pharmacy, was the guest speaker. Dr. Hammond's talk dwelt on a cruise he took last summer as a guest of the University's Naval ROTC unit. The following were elected to office: Y. A. Moore, Jr., president; Richard A. Polizzi, vice-president; Ira B. Humphrey, secretary; Harvey Wheeler, treasurer.

The following permanent committees were also appointed: Membership—Robert Rosser, chairman; Ruth Streeter and Jerry Henderson, members. Social—Bobby Work, chairman; Bobby Osborn and Joe Greco, members. Program—Joe Oliver, chairman; Charles Darling, member.

Branch President Carl N. Johnson reports that the **State University of Iowa Branch** enjoyed an attendance of some 80 at its February 17 meeting at which the principal speaker was Richard Hoffman, president of the Iowa Pharmaceutical Association. Mr. Hoffman's topic was "Organization and Duties of the I.Ph.A."

President Johnson also reports that the annual "Pharmacy Prize Prom" held on February 27 was a huge success.

On February 23 the **Philadelphia College of Pharmacy and Science Branch** convened in a joint meeting with the **Temple University Branch** at the latter's school. Joseph Zygraiowski, president of the Temple University Branch, officiated and the guest speaker was Dr. Fritz O. Laquer, professor of biochemistry at Temple University, who chose for his topic "Hormones in Personality."

Charles Gorske, branch president, officiated at the March 9 meeting of the **University of Wisconsin Branch.** Guest speakers were Drs. Sonnedecker and Diekmann, whose joint topic was "A Comparison of European and American Pharmacy."

The meeting was concluded with the setting up of a special committee to handle details attendant upon the sending of delegates to the Fourth District Convention at Purdue University.

On March 10 the **Oregon State College Branch** met to elect the following officers: Charles Bowls, president; Paul Billick, vice-president; Nan Steele, secretary; Barbara Sax, treasurer; James Swyter, historian.

Kenneth Ballard, president of the **University of California Branch** reports that the month of March was given over to a series of discussions relating to pharmacy and career opportunities for pharmacists. On March 3, an E. R. Squibb representative discussed the subject of promoting pharmacy to the public and to the physician. On March 10, Branch members were regaled with a motion picture *Inside Sharp & Dohme.* On March 17, Eli Lilly and Company sponsored a discussion dwelling on opportunities for detail men. On March 24, a Coffin Redington representative spoke on the function of the wholesaler and his ralation to pharmacy, and on March 31, the membership was addressed by a hospital administrator who discussed hospital pharmacy as a career.

Ernest H. Hogue of the Hogue-Davis Drug Company, Wheeling, W. Va., was guest speaker at the March 1 meeting of the **University of West Virginia Branch.** Margaret Kellison, Branch secretary, reports that Mr. Hogue gave a very interesting and enlightening talk on "The Changing Drug Business."

March meetings at the **University of Illinois Branch** were given over to discussions relative to subjects of the District Four Convention held at Purdue University the first week in April.

The Branch is sponsoring the awarding of a golden apple fob to the best instructor of the year. Each class will choose one instructor on the basis of learning or amiability.

At the March 10 meeting of the **University of Utah Branch** the guest speaker was Frank Tyree of Lederle Laboratories who discussed opportunities for pharmacists in detailing.

Tom Buchanan is chairman of the committee making arrangements for the annual dinner-dance to be held May 14 at the Roof Garden of the Hotel Utah, Salt Lake City.

Highlight of the March 18 meeting of the **University of Pittsburgh Branch** was a motion picture shown through the courtesy of E. R. Squibb & Sons, titled *Principles of Penicillin Therapy*.

Marvin Levick has been named chairman of a committee organized to spur attendance at meetings. Serving on the committee with him are Zola Horowitz and Dolores Malia.

John W. Marsh, Federal Bureau of Narcotics supervisor, was guest speaker at the March 18 meeting of the **University of Colorado Branch.** Titled "Narcotics," his talk dwelt on the Bureau's history, duties of its staff, and a review of recent cases wherein illegal narcotics peddlers were apprehended.

The **University of Maryland Branch** met February 16 and March 16, President Robert Sinker officiating at both meetings. At the earlier meeting, Paul Weissman, chief pharmacist of the Norwich Pharmaceutical Company, was the guest speaker. His topic was "Customer Protection by Manufacturing Pharmacists." At the March 16 meeting, the guest speaker was John A. Crozier, general manager of the Calvert Drug Company, who discussed "The Story of Cooperative Endeavor."

LOCAL BRANCHES

The **Puget Sound Branch** of the A.PH.A. met in Seattle, Wash., on February 18. President John Martin officiated and the guest speaker was Dr. George Farwell, assistant professor of Physics of the University of Washington, who spoke on "Radioactive Isotopes in Medicine."

At its March 18 meeting, the Branch had as its guest speaker Dr. James Fairbarin, head of the Department of Pharmacognosy, School of Pharmacy, University of London, England, Dr. Fairbarin's subject was "British Pharmacy and Health Plan."

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Mormon Church Choir Thanked

On Thursday evening, March 4, Jack B. Heinz, general chairman of the 1953 A.PH.A. Convention Committee, presented President Lester T. Hewlett of the Salt Lake City Tabernacle Choir with an anthem score as a token of appreciation from the AMERICAN PHARMACEUTICAL ASSOCIATION for the organ and song recital the choir gave the first evening of the 1953 A.PH.A. Convention.

Among those also present were Dean L. D. Hiner of the College of Pharmacy of the University of Utah, Everett W. Boyden, likewise representing the AMERICAN PHARMACEUTICAL ASSOCIATION, members of the Utah State Board of Pharmacy, officials of the L.D.S. Church, and the entire Choir.

National Health Council Forum

"Changing Factors in Staffing America's Health Services" was the subject of five simultaneous group discussions during the 1954 National Health Forum, held March 24 and 25 in New York City and presided over by Dr. William P. Shepard, second vice-president of the Metropolitan Life Insurance Company.

This year's forum was the public interest feature of the National Health Council's 34th annual meeting and was participated in by representatives of the forty-four national organization members of the Council.

Increase Colonels in Medical Services Corps

On March 23, President Eisenhower approved H. R. 5509 permitting the Medical Service Corps to have the same percentage distribution of full colonels as is now applicable to all other male corps of the Army. This is about eight per cent.

Pharmacists are commissioned in the Medical Service Corps of the Army, which includes the section on Pharmacy, Administration and Supply. The passage of H. R. 5509 and its approval by the President opens the way for permanent promotion to the grade of colonel for more members of the present commissioned pharmacy personnel in the Medical Service Corps.

Civil Defense Course

A course in civil defense operations has been added to the curriculum of the Staff College, National Civil Defense Training Center, Olney, Md. An addition to the administration course previously offered, it is intended to give civil defense officials both theory and practical work in operations under assumed attack conditions. It reviews civil defense urban analysis, which provides the tools for realistic civil defense planning, and tells how to develop operational plans.

Army Civilian Strength Reduced

During the first half of fiscal year 1954, the Army reduced its civilian personnel strength by approximately 45,000 employees, the Department of the Army announced.

Reductions effected were accomplished principally through attrition and were made possible as a result of manpower utilization surveys, consolidations of activities, lowered workload factors in certain fields, and the reprogramming of available civilian manpower. During the period, employment rights of career civil service employees were fully protected, and under Department of the Army policy, separated civilians were not replaced by military personnel.

Red Cross Reports on Blood Use

During 1953, the Red Cross collected blood for civilian use at the rate of 145,000 pints a month. The organization also provided blood for defense purposes at the rate of 167,000 pints a month, including approximately 30,000 pints collected monthly by community blood banks which cooperated through August 31 in the defense collection program. In addition, the Red Cross provided the Office of Defense Mobilization with more than 9,000,000 cc. of gamma globulin during 1953 to be used in the modification or prevention of measles and infectious jaundice and as a weapon against paralysis from polio.

Army to Call 18,000

The Department of Defense has requested the Selective Service System to provide Armed Forces Induction Stations with 18,000 men during May for the Army. The Navy, Marine Corps, and Air Force do not intend to place any calls with Selective Service for May.

New Mercy Plane

The Military Air Transport Service has added the "Samaritan" to its domestic air evacuation fleet. The plane, a Convair C-131A, is the world's most modern twin-engine mercy mission aircraft featuring safety, speed, and comfort. The 235-mile-an-hour double-duty plane is air-conditioned and has a pressurized cabin allowing many different arrangements of litters and seats. Varying combinations up to 37 seats or 27 litters and 7 seats can be made. All seats will face rearward, as an added safety measure.

One flight nurse and two medical attendants normally will accompany Armed Forces patients on regular runs.

The "Samaritan" will be used to deliver patients from ports of entry to hospitals of destination throughout the United States. It will also be used for transfers between hospitals in the United States.

BRIEFLY NOTED

ASSOCIATIONS

The **Northwestern Ohio Pharmaceutical Association** has elected the following officers: Glenn Halderman, president; Harold Primmer, vice-president; Charles Tippin, secretary; John Cook, treasurer.

At the March 1 meeting of the **Eastern Ohio Pharmaceutical Association,** the guest speaker was John W. Kerensky, attorney, who spoke on "Social Security and the Professional Man."

The **New Jersey Pharmaceutical Association** sponsored on April 14 at Rutgers University College of Pharmacy an all-day workshop conference for a proper evaluation of the adequacy or inadequacy of present pharmaceutical education.

The 84th annual convention of the New Jersey Pharmaceutical Association will be held June 27–July 1 at the Berkeley-Carteret Hotel, Asbury Park, N. J., and will emphasize the professional aspects of pharmacy.

The annual mid-year meeting of the **New Hampshire Pharmaceutical Association** will be held May 25 at the Hotel Carpenter, Manchester, N. H.

Book awards were presented to the four outstanding students in the College of Pharmacy of Loyola University of the South on March 18 by Mrs. Harold Mooney, president of the Women's Auxiliary of the **Louisiana State Pharmaceutical Association.** Joseph Singerman was awarded a *U. S. Dispensatory.* Aubrey Cowl received a *Merck Index* and Lloyd P. Boutte and Ronald P. Quintana received a *United States Pharmacopeia* and a *National Formulary,* respectively.

The February 8 meeting of the **New York Branch** of the A.PH.A. was held at St. John's University College of Pharmacy. Guest speaker was Dr. Gladys Emerson of the Merck Institute, Rahway, N. J., whose topic was "Research on and Physiological Activity of Vitamin B_6." A film entitled "Vitamin B_6-Pyridoxine" was also offered. There followed an enthusiastic discussion period. Dr. Emerson was given a rising vote of thanks.

The "March of Medicine" feature on overweight, sponsored and produced by Smith, Kline & French Laboratories, in cooperation with the **American Medical Association,** was telecast over more than 70 stations of the National Broadcasting Company's television network on March 11. The second program of the spring series will be a comprehensive report on arthritis and rheumatism to be televised on April 29, and the third program will come from the Annual Meeting of the American Medical Association in San Francisco, June 24.

A special group, whose purpose will be to develop new methods for the earliest possible reporting of drug-induced blood abnormalities and to seek ways of experimental approach that might enable more accurate prediction of potential dangers from new therapeutic agents, has been organized by the American Medical Association.

The **National Association of Retail Druggists** has announced that its 56th annual convention will be held in Houston, Texas, during the period October 10–14. Business sessions and the Association's drug show will be held in the Houston Coliseum.

A grant of $54,000 to the University of Michigan for a study of the medical service program which has been in operation in Windsor, Canada, for fifteen years, offering subscribers complete prepaid physicians' services on an insurance basis, has been announced by **Health Information Foundation.** It will be conducted by the University's Bureau of Public Economics, under the supervision of Dr. Nathan Sinai, Director of the Bureau.

The annual joint meeting of the **American Association of Colleges of Pharmacy** and the **National Association of Boards of Pharmacy,** District No. 2 (eastern seaboard states), was held at Pocono Manor Inn, Pocono Manor, Pa., March 28 to 30. Principal speakers were Prof. Richard A. Deno, secretary, A.A.C.P., who gave a report on the association's activities; Dr. John W. Paige, chief, Bureau of Professional Examinations, N. Y. State Education Department, who spoke on "Observations on Objective Testing," and Dr. Carrol V. Newsom, associate commissioner of education, State of New York, whose address was on "General Education in the Pharmacy Program." Dean Hugo H. Schaefer of Long Island University, Brooklyn College of Pharmacy, was the toastmaster.

Dr. M. G. Candau, Director-General of the **World Health Organization,** will submit the Annual Report for 1953 to the World Health Assembly opening in Geneva on May 4. This report, covering the fifth year of WHO's existence, concerns a period almost equally divided between the last months of Dr. Brock Chisholm as Director-General, and the first months of Dr. Candau's appointment. "There was no rupture of continuity in either the

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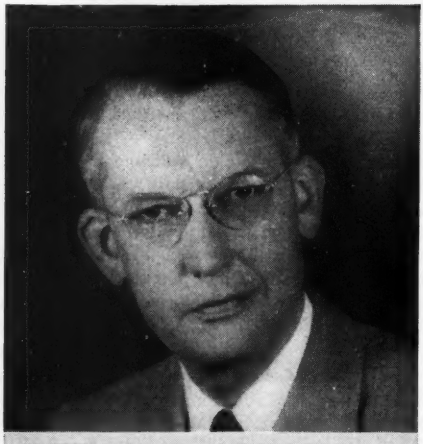

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basic policies or the work of the Organization," says Dr. Candau in his introduction to the report; "this in itself is a measure of the wisdom and imagination which enabled my predecessor to establish the structure of the Organization on a sound foundation."

MANUFACTURERS

A special scroll award for outstanding contributions to medical education has been presented to **Smith, Kline & French Laboratories** by the Michigan State Medical Society.

Colgate-Palmolive Company, Jersey City, N. J., has been granted a temporary injunction in the Superior Court of New Jersey enjoining a firm known as "Colgate Laboratories" from using the "Colgate" name. "Colgate Laboratories," also located in Jersey City, advertised a product called "Sternalan" for the treatment of psoriasis. Colgate-Palmolive Company has no connection with the product advertised or the laboratories.

Sandoz Pharmaceuticals, division of Sandoz Chemical Works, Inc., have moved their sales and executive offices from New York City to their manufacturing laboratories on Route 10 in Hanover, N. J.

J. B. Roerig and Company announces that pharmacists may obtain copies of the National Research Council's dietary chart, by addressing their requests to the company's advertising department.

AT RANDOM

The Gold Heart Award for outstanding contributions to the advancement of cardiovascular medicine and the Heart Program was presented April 4 by the American Heart Association to **Dr. Howard B. Sprague,** Boston, clinical associate in Medicine at Harvard Medical School, and **S. DeWitt Clough,** managing director of the Chicago Heart Association.

Myron Pantzer, vice-president of the Panray Corporation, has been appointed a member of the National Drug Committee of the American-Korean Foundation.

B. R. Mull has been appointed director of special assignments for Eli Lilly & Co. in Indianapolis, Ind., serving as staff assistant to Harry A. Kimbriel, marketing vice-president for the company. **J. W. Lansdowne** has been named manager of the newly created customer promotion service department.

Dr. Ernest H. Volwiler, president of Abbott Laboratories, North Chicago, Ill., has been chosen to receive the Chemical Industry Medal for 1954 for conspicuous services to applied chemistry. Presentation will take place at a dinner in his honor in Chicago, October 12.

Dr. Justin L. Powers will attend a meeting of the Expert Committee on the International Pharmacopoeia to be held in Geneva, Switzerland, between June 23 and July 3, 1954. He has been a member of the World Health Organization Expert Advisory Panel on the International Pharmacopoeia since January 1952.

Dr. Leonard A. Scheele, surgeon-general of the Public Health Service, U. S. Department of Health, Education, and Welfare, has announced a reorganization of the Bureau of State Services, effective April 5. This will consolidate the Bureau's operating divisions from sixteen to six—General Health Services, Special Health Services, Sanitary Engineering Services, International Health, Dental Public Health, and the Communicable Disease Center, Atlanta, Ga.

Dr. Stephen Wilson, chairman of the A.PH.A. Committee on Social and Economic Relations, represented the ASSOCIATION at the National Governors' Conference on Mental Health at the Hotel Statler, Detroit, February 8 and 9.

Frederick J. Stock, member of the A.PH.A. and vice-president of the Commercial Development Division, Mathieson Chemical Corporation, has been named president of the New York Board of Trade for the current year. He headed the drug section in the Industry Operations Division of the War Production Board during World War II.

Participants in a panel on duplication at a meeting of the New York Academy of Pharmacy on March 31 were **William R. Arscott,** vice-president of E. R. Squibb and Sons, who expressed the views of the manufacturing fraternity; **Leslie C. Jayne,** secretary of the New York State Board of Pharmacy, who discussed the question from the standpoint of a law enforcement official; and **Max Evans,** editor-in-chief of the *Brooklyn Pharmacist,* who gave the opinion of a retail pharmacist.

Klumpp Calls for Change in Compulsory Retirement

Speaking before the Ohio Citizens' Council for Health and Welfare at its recent Conference on Aging at Ohio State University, Columbus, Ohio, Dr. Theodore G. Klumpp, president of Winthrop-Stearns, Inc., called industry's widely accepted policy of compulsory retirement of workers at the age of sixty-five "economically wasteful and socially harmful."

He stated that there are approximately twelve million persons today who are sixty-five years of age or over and that in less than thirty years the U. S. is expected to have at least twenty-four million in that age group and sixty-six million over forty-five. Dr. Klumpp assailed the error of "wasting the contributions of those who have learned to do their jobs well and are able to continue to do so faithfully."

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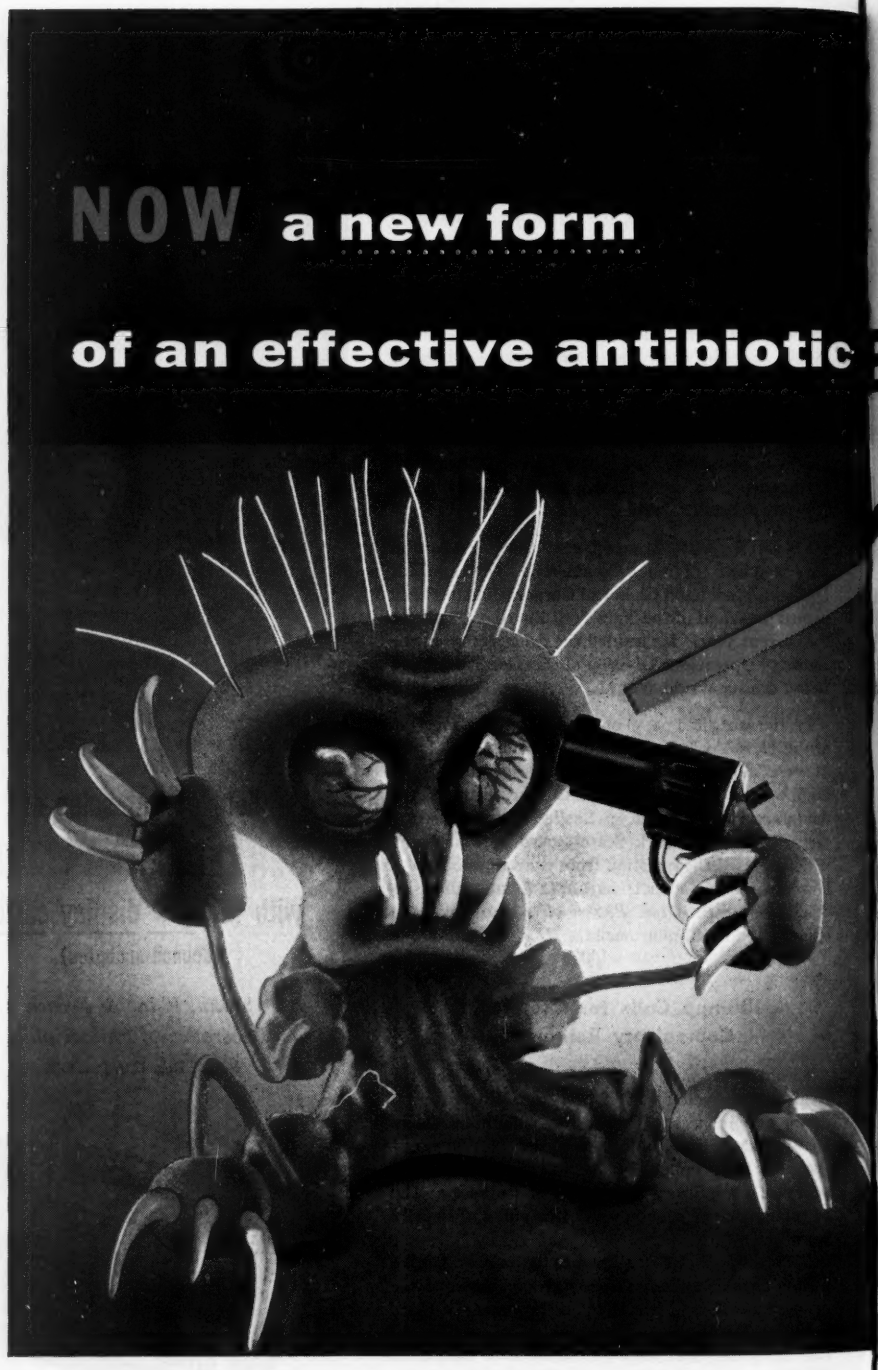
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8. A medicated cough syrup was formulated utilizing ten of the fruit syrups and each vehicle was evaluated and its "demulcent" index calculated.

9. The addition of gums to a medicated cough syrup did not always tend to increase the masking properties of the vehicle, but in general the demulcent characteristics were increased by the addition of acacia, Kelcosol, and CMC.

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